MINING & PETROLEUM STANDARD

AND

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PETROLEUM.

Development of Petroleum as a Science.

Owing to a lack of inducement and the ignorance of the operatives in the early history of petroleum, wells were seldom sunk lower than two or three hundred feet in any locality, and if oil was not then struck the hole was abandoned as a failure. A large amount of labor and capital were thus fruitlessly wasted, and some of the very best oil territory discarded for want of perseverence. The recent and valuable "strike" of the Phillips Well, on Cherry Run, is one among many illustrations which attest the benefit of indefatigable perseverence in testing oil territory. This well was the third hole drilled on a small lease, both of its predecessors having proven failures, and the one in question, previous to its first yield of 500 barrels per day, having given but very slight indications of becoming a good well. Perseverence may almost be called the philosopher's stone of the oil field, and almost certain to turn everything it touches, eventually, to oil. Experience has now demonstrated that oil may be found in every locality, and that no particular surface indications are essential to its discovery. At Pithole the first discoveries were made more than 600 feet below the surface of the lowest valley, and in the fourth sand rock. Since then those discoveries have climbed the hill-sides, and one of the very best producing wells which that eminent locality boasts is now nearly 100 feet above the level of its compeers. Since its discovery the oil has, from some unknown cause, risen spontaneously to the surface of the soil, at least 150 feet above the level of the valley, and filled every pore and vein with a tiny stream of the rich dark green fluid. Old wells, which were long since abandoned, have suddenly commenced producing from sudden but not apparent cause. Petroleum is yet a profound mystery, and, although the science of its development has made important and progressive strides, it still must be regarded as in its infancy. Its freaks are as extraordinary as they are various. They are facts nevertheless, and cannot be gainsayed. Upon each successive extraordinary occurrence numberless theorists are ready to account for it;—the number of these theories is however only exceeded by their vagueness. They, too, are generally but freaks of the imagination, and when traced back, usually are found to emanate from some interested source. While facts themselves are thus extraordinary and unaccountable, nothing but prolonged, careful, actual investigation can draw the line between them and fiction. Excitement has drawn hither a great number of people from all quarters; all eager to invest in so profitable a source of wealth.—Without previous experience, they have been taken off their guard by witnessing it literally pouring from the earth's surface. Prudence is laid aside and avarice intoxicated. Already has credulity been stretched to its utmost limits, but now the evidence of sense exceeds the utmost limits of belief. Thus buoyed up by occular demonstration, it is ready again to stretch its flights far beyond all preceding limits of belief. It is needless to say how much stretching it gets before completing the circuit of the oil regions. Every individual who has a bad lease on hill-side or vale, takes advantage of it and has many theories to prove that the locality where his property is situated is the most desirable.—In nine cases among ten, purchases are made with little judgment and less experience. The last dollar is often invested in a worthless lease, which was probably not bought by the crafty speculator, until its sale to his victim had been previously negotiated, or perhaps he had never owned it, but was simply paid for puffing it through the market. Enormous sums have thus been lost and made on territory where it was never supposed, by the initiated, that oil really existed.—Those who pocketed the money have held their peace, and gone their way rejoicing, while the victims have been loud in their outcries against the barrenness and nefarious practices of the oil regions.

Simply buying and selling oil territory is dealing with a fictitious capital, and has little or no real connection with judiciously developing it. If the entire country were sold and the national capital all to change hands, it is obvious that, although individuals might gain or lose by the transaction, the country would do neither. There would be precisely the same amount of labor and property in it as before. On the other hand, if $20,000 is invested economically in sinking four wells which afterwards yield in the aggregate $60,000, the difference between these two sums is so much clear gain to somebody. Experience has fully demonstrated the fact that oil territory, in general, should be developed by large companies with ample means. The impetus of a ponderous body is not interrupted by slight obstacles. The loss of a few *dry holes* is not felt by a wealthy company, until that loss can be made good by other producing ones, while in the case of an individual, the business is too often a lottery staked on a single throw. On the result his fortune or ruin depends. If he chances upon a productive vein he becomes at once "a successful operator, remarkable for his shrewdness and remarkable business capacity." On the other hand, if the hole proves dry, his prototype is so often encountered in the oil field as to need no description.—*Reno Times.*

HOW PETROLEUM IS FORMED.

Professor Wilbur's Theory.

There have been numerous theories proposed to account for the origin of petroleum. Mr. White, of Toronto, who had published a book on the subject, thought it had come from a union of the carbon of the carboniferous limestone with the hydrogen of the water.—This was what might be called a chemical theory, but he feared that chemists and men of science generally would decline to accept it. Petroleum had been supposed to have been formed from the remains of land animals, and fishes. He had heard of the whole theory, which supposed the petroleum deposits to have been formed from the remains of vast shoals of whales, sunk down and imprisoned long ago in the rock formations while forming. This, as well as some other theories he had heard of, could scarcely be maintained without provoking a smile. Meanwhile he had his own theory, and he thought it as good as any of the rest, perhaps better. His idea was, that oil had been formed from marine vegetation, just as coal had been formed from that of land. Every coal bed had clay below and slate above. There was a certain uniformity in the conditions under which coal was formed, which pointed to a certain uniformity of process in its formation, and to one great epoch in the geological time when it was formed. Peat was at first formed, and this afterwards became coal. Few persons had any adequate idea of the immense growth of seaweed in the depths of the ocean. It had been shown that seaweeds had in their composition a large amount of oily, carbonaceous matter. After their term of growth was fulfilled they became detached, floated off, and finally sunk to the bottom. Now it was a received opinion among geologists that this portion of the North American continent had once been the bed of a salt water ocean. The ocean floor, as they must remember, was not level by any means, but had throughout its whole extent deep hollows and rising ridges. It was of course in these deep hollows that these seaweed deposits would find their last resting place, after long tossing about in the waves and ocean currents. In this way it would come to pass that they would not be evenly distributed over the bottom, but only in those hollows or pockets. Meanwhile the deposits of solid, stratified rock, or what afterwards became such, was going on, and after untold ages these masses of seaweed became covered to various depths. He considered it no very unreasonable or unscientific supposition, that these masses of oily, carbonaceous matter should, under the circumstances, take the form of oil, of a liquid hydrocarbon. They had seen that oil existed in and was distilled from coal, which was conceded to be the remains of terrestial vegetation. There was, therefore, nothing violent in the supposition that petroleum, so exactly like coal oil in its properties, had been formed from marine vegetation. The vegetable origin of both, he contended, was indubitable. But further, it so happened that the Devonian rocks which contain these deposits, were also the rocks in which salt was found, in immense subterranean reservors of brine, now condensed or saturated far beyond the saltiness of the ocean. These two deposits, oil and salt, were thus brought closely together in point of geological time. The salt was allowed to be an ocean deposit, and if so, the inference was fair that the oil was one also. Although of a different nature, and formed in a different way, it had been laid down about the same time, that was, when this section of the country was an ocean bed. He considered this to be very strong proof that petroleum was, as he had said, the product of immense deposits of marine vegetation.—*Lecture delivered in Hamilton, C. W.*

Improvement in Treating Hydrocarbon Oils, and in Vessels for Containing Them.

In the ordinary purification of oils derived from the distillation of coal, shale, or peat at low temperatures, and which are commercially known as coal, shale, and peat oils, it is usual to treat the crude or distilled products with sulphuric acid as a preliminary process of purification.

John Fordred, of Blackheath, has obtained letters patent from the British Patent Office for an invention which has for its object the substitution of an alkaline preliminary treatment in lieu of the acid process, whereby a large proportion of coloring matter and other constituents are separated therefrom; and not only is the subsequent purification facilitated, but the proportions of acid and alkaly are materially lessened, and the products obtained are of superior quality.

The patentee places the oil, either crude or distilled,

in a suitable vessel, provided with an agitator, and to every one hundred parts by measure of oil, adds from two to five parts by measure of a solution of caustic soda, marking 37° Baumé, or thereabouts. The proportion of the alkaline solution will vary according to the quality of the oil to be operated upon, but from two to five per cent. by measure of the alkaline solution generally effects the desired purpose. The temperature of the mixture is then raised so as not to exceed 100° degrees Fahrenheit; agitation is then continued until thorough admixture of the alkali and the oil has been effected; the flocculent and other insoluble matters that have been formed are then allowed to subside, and the clear supernatant oil is to be drawn off. Oil thus treated may be acted upon by a small quantity of sulphuric acid, and after agitation and subsidence of the impurities thus separated, the clear oil may be drawn off and again be submitted to an alkaline treatment, but the proportion of alkali (for example, of caustic soda) which will be found necessary for this operation will not generally exceed about one part by measure of a solution of caustic soda marking 37° Baume, or thereabouts, to every one hundred parts by measure of the oil under treatment. These processes may, if necessary, be repeated, or the oil, after preliminary alkaline treatment, may be subjected direct to distillation, or, as before mentioned, may be submitted to any of the well known processes of purification. After the oils have been subjected to any or the foregoing processes of purification or refining, or when such oils have been refined by any other process, a turbidity which is possessed by some of these oils may be removed, and they may be made bright by filtration through a bed or filter of fuller's earth.

In treating the crude or distilled oils with the caustic alkali, as before mentioned, a deposit is obtained, and a deposit also results from the treatment of the oils with sulphuric acid. Now another part of the invention consists in the suitable admixture of these deposits, or foots, so as to free or liberate the compounds or bodies united with the alkali on the one hand, and the acid on the other, and, in addition, to obtain a residuum of a sulphate of the alkali. The separation of the salt thus formed is effected by the addition of a small proportion of water with the injection of steam, and the oils, grease, or compounds thus liberated may be separated and stored for use. The resulting solution of sulphate of soda or potash may be evaporated, and may be employed in the arts.

In order to store or transport the refined or finished oils, it is customary to line or paint the interior of the wooden casks with a solution of glue; but instead of this the patentee lines the vessels with a mixture of glue and treacle of such a composition as will be found adhesive and elastic. Thus, he takes one hundredweight of hard glue and soaks it in water until it becomes soft; he then places it in a steam pan and adds two hundredweight of treacle, and incorporates them together, and applies the same, hot, to the interior of the vessels.

[The glue and treacle process is old in this country. —EDS.]

☞ We have mentioned several times, says the Wabash *Express*, the progress of boring an oil well at Lodi, on the Wabash, some forty miles north of this city (Terre Haute). A few days since the augur broke through the roof of a cavity. The augur was taken out when the gas began to come up in considerable quantities, pushing the salt water before it, causing it to flow over the conductor. After the salt water was driven out, sulphur water continued to flow in a small stream. The well was sunk four feet deeper, which opened new cavities and the water increased to ten gallons a minute, and it is now flowing five hundred barrels a day of white sulphur! The water as it flows from the conductor is white; after standing awhile it deposits a white sediment and becomes clear. On being agitated it boils and emits gas. In mineral ingredients, disagreeable smell, and specific gravity, it is said to exceed the Lafayette Artesian—especially the sulphurous odor—and it is claimed it will rank with the most famous medical waters of the world. The company we understand will cease boring until the water is analyzed and tested.

MINING.

Mining in Nevada—Reese River District.

An elaborate and highly interesting report upon this region has been prepared by Mr. A. Blatchley, M. E, of Austin, Nevada, in which he remarks that the Great Basin, of which Reese River is the center, is one of the most extensive mining districts discovered in ancient or modern times, not excepting Mexico or Peru. Explorations for over 50 years have been extended in every direction, without finding any boundaries. So that now it is generally conceded by explorers that the Great Basin, bounded on the west by the Sierra Nevada, and on the east by the Rocky Mountains, is one vast field of mineral deposition. It is the broadest portion of the great mineral belt running along the western shore from the northern to the southern end of the American continent. All the rivers in the Basin, except the Colorado, sink into the sand, and lose themselves—none running into the sea; although some of them run long distances with great volumes of water, as the Humboldt, the Carson, the Walker, the Truckee and the Reese Rivers, all run into shallow lakes and sinks. Evidence showing that in former times water was much more abundant than at present, is found throughout the Basin. All the useful metals, as gold, silver, lead, antimony, mercury, arsenic, magnesia, and iron, are found here in abundance; also tin in small amounts. Gold and silver are the only metals mined at present, but when this country is connected with others by railroads, and capital introduced to develope its mineral resources, then all the metals known to commerce will be produced in unlimited quantities.—Only five years have elapsed since the first silver was worked in the Basin, and last year the amount shipped from Nevada nearly equalled the amount produced in Mexico, the greatest silver-producing country in the world, and the production of this year will double that of last. The mines of Reese River are noted for their wonderful richness, and remarkable for the great number that exist within a small compass. The average yield of all the ore worked in the mills of Austin is near $144 per ton; this includes all good, bad and indifferent mines. The ore that has been worked up to the present time has been mostly from the surface, and has been assorted by inexperienced men, and was not near so rich as that at present being worked. Still, with all these disadvantages, the yield has been greater per ton. Nearly every variety of silver ore known to the mineralogist is found in Reese River. Native silver is found as wire silver, and in thin lamina between different layers of ore, and also in masses of irregular shape, mixed with ore. This latter variety is mostly found in the Revenue Mine, on Lander Hill, where pieces weighing five pounds have been found. It is also found in minute particles in the oxide of iron, forming the ore known in Mexico as the colorados. Near the surface, above the water level in the mines, the ores are materially different from those found below it. The ores found above the water level are chloride, iodide, bromide, and selenide of silver. Below the water, sulphur enters into most all the combinations of silver, and the ores are a combination of silver, sulphur, and many other metals, as iron, antimony, arsenic, lead, copper, zinc, manganese, and selenium. Nearly all the mines in the Reese River, have been worked under great disadvantages. The greatest difficulty has been want of means and lack of materials, incident to all new and barren countries. The greater number of the first locators here were without means sufficient to open and develop one claim in a manner to prove its richness or value. But, owing to the facility of making locations, every miner held from 20 to 200 claims, consequently opening them was out of the question.—Many of the first locators formed incorporations, either here or in California, apparently to work their mines, but really to sell their claims. The result was that a mine would be held by a hundred different men in every quarter of the globe, and concert of action would be impossible, and many of the best mines in the district have not been worked on this account; and many of the incorporations being composed of men without means, could not open their mines.

GAS.

GAS INSPECTION.

The following is a synopsis of a bill recently passed by the Legislature of Ohio, the title of which is, "A bill for the inspection of gas meters, the protection of gas consumers, and the protection and regulation of gas light companies."

Section 1 of the bill provides that the Governor shall, with the advice of the senate, appoint an Inspector of Gas Meters and Illuminating Gas, whose duty it shall be, when required, to inspect, and ascertain the accuracy, of gas meters to be used for measuring the quantity of gas to be furnished to consumers, and when found correct, to seal, and mark such meters with some suitable device, and with his name, date of inspection, and the number of burners each is calculated to supply.

Section 2 provides that he shall hold his office for the term of three years, and he shall receive an annual salary of three thousand dollars, to be paid out of the treasury on the warrant of the Governor; that he shall not be, directly or indirectly, interested pecuniarily in the manufacture or sale of gas, or any article or commodity used by gas light companies, or for any purpose connected with the consumption of gas; and shall not give certificates or written opinions to any maker or vender of any meter, or of any such article or commodity; and shall give bonds in the sum of five thousand dollars for the faithful discharge of his duty.

Section 3 provides that said inspector shall, within three months after appointment, furnish to the Treasurer and Auditor, a list of all the gas light companies in operation in the State, and his salary for the year, and annually thereafter, shall be assessed and paid into the treasury of the State by the several gas light companies in the State, in amounts proportionate to their appraised valuation, as declared in the returns required in the general statutes of that State; and in case such gas companies or either of them shall refuse or neglect to pay into the treasury the amount or portion of said salary which shall be by the said treasurer required of them respectively, for the space of thirty days after written notice to make such payment, then the treasurer shall institute an action in the State against such delinquent gas-light company for their portion of such salary, with interest thereon at the rate of six per cent. per annum from the time such notice to make payment was given, and the costs of the action.

Section 4 provides for the appointment of deputy inspectors in any city or town whenever said Inspector shall be unable to attend to the duties therein, subject to the same disabilities as provided in section 2, and who shall be paid by fees according to the amount of gas passed by the meters examined.

Section 5 provides that the standard or unit measure for the sale of gas by meter, shall be the cubic foot, containing sixty-two and three hundred and twenty-one one-thousandth pounds avordupois weight of distilled or rain water, weighed in air of the temperature of 62° Fahr. scale, the barometer being at 30 inches.

Sections 6 and 7 are immaterial.

Section 8 provides that every gas-light company with a capital paid in of $100,000, or more, and every maker and vender of meters, shall set up at some convenient place upon their premises a gas-holder, to be tested, and if correct, stamped and sealed, containing five or more cubic feet, by means of which meters shall be tested at the average pressure at which gas is supplied in the city or town where they are to be used; there shall be provided by every gas-light company a test meter of a construction approved by the Inspector and stamped by him, to be used in cities or towns where no test gas holders are provided, or whenever proving by a gas holder it impracticable; no dry meter shall be stamped which varies more than two per cent. from the standard measure of the cubic foot, and no wet meter shall be stamped correct which is capable of registering more than two per cent against the consumer and five per cent. against the company.

Section 9 provides that meters in use shall be tested

at the request of the consumer or the company, in the presence of the consumer, if desired, with sealed apparatus, by the Inspector or deputy Inspector. If the meter is found correct, the party requesting the inspection shall pay the fees and the expense of removing it for the purpose of being tested; if incorrect, the company shall pay the expenses, and furnish a new meter without charge, to the consumer.

Section 10 provides that illuminating gas shall not be merchantable in that State which has a minimum value of less than twelve candles; every gas is to be tested with the burner and pressure best adapted to it, and the result calculated at a temperature of 70° Fahr. Whenever requested by the Mayor and Aldermen of any city, or the trustees of any town, the Inspector shall report to them whether the gas supplied in their respective city or town is of a legal standard, and if it is sufficiently well purified from sulphuretted hydrogen, ammonia, and carbonic acid.

Section 11 provides that any officer or servant of a gas-light company, duly authorized, may at any reasonable time, enter the premises lighted by gas furnished by such company, for the purpose of examining or removing the meters, pipes, fitting and works for supplying or regulating the supply of gas, and of ascertaining the amount of gas consumed or supplied; and if hindrance be offered to such officer or servant by any person, complaint may be made to a justice of the peace, who may issue a warrant directing the sheriff or any constable to take sufficient aid and repair to such premises, and protect such officer or servant in the discharge of his duties.

Section 12 provides that if any person supplied with gas, neglect or refuse to pay the amount due for the same, or for the rent of the meter or other articles hired by him of the company, such company may stop the gas from entering the premises of such person: in such cases, the officers, servants or workmen of such gas-light company may, after twenty-four hours' notice, enter the premises of such party between the hours of eight in the forenoon and four in the afternoon, and separate and take away such meter, or other property of the company, and may disconnect any meter, pipes, fittings or other works, whether the property of the company or not, from the mains or pipes of the company.

Section 13 provides that every person who willfully or maliciously injures or suffers to be injured, any meter, pipes, or fittings belonging to any such gas light company, or prevents any meter from duly registering the quantity of gas supplied through the same, or in any way hinders or interferes with its proper actions, or fraudulently burns the gas or wastes the same, shall, for every such offense, forfeit and pay to the company not more than one hundred dollars, to be recovered in action brought by the company against such offender, and in addition thereto, shall pay the company the amount of damage by them sustained by reason of the same.

Section 14 provides that every person who attaches any pipe to any main, or pipe belonging to any such gas light company, or otherwise burns, uses, or causes to be used, any gas supplied by such company, without their written consent, unless the same passes through a meter set by the company, shall forfeit and pay to said company the same fine, and in the same manner, as declared in section thirteen.

This act applies to all companies who manufacture gas to sell, and takes effect in three months after the passage of the bill.

Composition of Atmospheric Air.

The average composition of atmospheric air may be thus stated:—

	Oxygen,	20·61	100·00
	Nitrogen	77·95	
	Carbonic acid	·04	
	Aqueous vapor,	1·40	
	Nitric acid,		Traces.
	Ammonia,		
	Carburetted hydrogen,		
And in Towns.	Sulphuretted hydrogen,		Traces.
	Sulphurous acid,		

The respiration of animals and the combustion of gas, lamps and candles, have a similar effect on the oxygen of the air; while the hydrogen of combustible bodies, uniting with another portion of oxygen, forms vapor of water in considerable quantities—a pound of oil during its combustion giving off more than a pound of water in addition to the carbonic acid. Animals also give off a considerable portion of vapor of water, combined with animal effluvia of a putrescent character.—*Ibid.*

Solubility of the Gases.

The following table shows the solubility of the gases named in one volume of water at 32° and 59°:—

Gases.	At 32° F.	At 59° F.
Ammonia	1049 60	727 2
Hydrochloric acid	505 9	458 0
Sulphurous acid	68·861	43·564
Sulphuretted Hyd'n.	4·3706	3·2326
Chlorine	Solid.	2·368
Carbonic acid	1·7967	1·8820
Protoxide of nitrogen	1·3052	0·07780
Olefiant gas	0·2563	0·16150
Marsh gas	0·05449	0·03909
Carbonic oxide	0·03287	0·03432
Oxygen	0·04114	0·02989
Nitrogen	0·02035	0·01478
Air	0·02471	0·01795
Hydrogen	0·01930	0·01930

The gases thus taken up by water may all, with the exception of hydrochloric acid, be expelled by boiling. Other liquids besides water dissolve the gases with greater or less avidity; thus alchohol at 32° dissolves of sulphurous acid 328 62 times its own volume.

MISCELLANEOUS.

Entered according to Act of Congress, in the year 1866, by J. W. Bryant, in the Clerk's Office of the District Court of the United States, for the Southern District of New York.

TREATMENT AND USES OF PEAT AND PEATY MATERIAL.

BY J. BURROWS HYDE.

(*Continued from page* 277.)

The material which I prefer to name ulmin, instead of peat or muck, is the result of vegetable materials that have been decomposed, forming a substance, which when wet, seems to be an aggregation of finely pulverized matter. In some situations the decomposition progresses until it has a resinous or gum-like appearance when dry, and then resembles real ulmic acid with which it seems identical.

Ulmin should always be partially dried before being pressed; for which the forces applied have been from three pounds to four hundred pounds per square inch. The statistics given of its weight vary so much that it must, in a considerable degree, arise from moisture.—Eight hundred to one thousand pounds for that which has been well drained, and five hundred to eight hundred pounds for well dried, per cubic yard. When pressed it should be reduced in bulk at least one-third.

In the year 1842 there were 59,000 men employed in France "harvesting peat," and at an average cost of $1,75 per ton.

Ulmin varies in quality not only from the different proportions of its proper materials, but from the admixture of foreign elements, which also vary in proportion and kind. Carbon, potash, and ammonia; lime, soda, magnesia, and allumina—as carbonates, sulphates, or phosphates—; also iron, lead, and even copper and always hydrogen and oxygen, make up the varied properties.

In a careful analysis, 100 parts of peat from different localities, gave:—

	Carbon,	Volatile Matter.	Ash.
Scotland,	25	73	2
England,	37	48	15
Ireland,	61	37	2
do	20	71	9
do	65	22	13
France,	58	28	12
do	22	70	8
do	33	58	9
Wurtemberg,	25	70	5
Bohemia,	67	30	3
Maine, U. S.,	21	72	7

In one of the establishments referred to for "8,200 lbs. of ulmin and 1,025 lbs. sulphuric acid, the product was 818 lbs. sulphate of ammonia, 517 lbs. acetate of lime, 19 gallons naphtha, 11 lbs. paraffine, 73 gallons volatile oil, and 36 gallons fixed oil," carbon and gas not given.

In another, for 2,000 lbs., the yield was "36 lbs. light oil, 36 lbs. heavy oil, 30 lbs. resinous asphalt, 8 lbs. paraffine, 24 lbs. sulphate of ammonia, 5 lbs. acetic acid, 8 lbs. naphtha, 60 lbs. creosote, 320 lbs. gas, and 700 lbs carbon."

Another gives, for 2,000 lbs., "370 lbs. ammoniacal liquor, 100 lbs. tar with paraffine, 720 lbs. charcoal, and 12,500 cubic feet of seven-candle gas. But had the peat been thoroughly dried, and the tar and paraffine consumed, the light would have been equal to the best coal gas."

As a Fuel, ulmin is always improved if compressed, as this retards combustion and gives greater heat; but, if cut in blocks of the proper size and well air-dried, it answers well. In burning, it gives off a great volume of carburetted hydrogen gas; the hydrogen being in excess, it affords a flame with but little or no smoke and with intense heat, leaving a mass of incandescent coal with good heating properties. Being free from any impurity that will attack iron peculiarly fits it for generating steam. It gives clean plates and flues to absorb the heat rapidly. These properties also adapt it for smelting metals.

For domestic use it is more essential that it be well dried if used in an open fire, because the water vapors which first pass off prevent the combustion of the gas, and unpleasant odors may escape into the room. It is also essential for its economic use that the flues be adapted to the fuel. Treadgold gives as the result of one of his experiments in evaporating one cubic foot of water, "Newcastle coal, 8·40 lbs.; coke, 7·70 lbs.; charcoal, 10·60 lbs.; peat charcoal, 23 lbs.; and peat, 30 lbs." It is clearly evident that his apparatus was not adapted to burning peat or charcoal.

In a trial on the Paris and Lyons Railroad, "we got up steam with peat in 30 minutes, coal requiring 120 minutes. We ran 16 miles to a gravel pit, up a steep grade, and from there took on a load of 136 tons, 80 miles further when the blaze escaped a considerable distance above the chimney which became red hot, and the boiler covering taking fire, we had to stop to extinguish it. After repairs we returned to Paris with 38 miles per hour, the heat again increasing as we advanced. The fuel having no smoke and much gas keeps up a constant hot flame. The pressed peat gives far better results than that which is not pressed. In fact, while using it the generation of steam was so rapid I stood with my hand on the valve lever all the time, fearing an explosion. I found two pounds of pressed peat to produce more steam than one pound of the best coke." A firm near Sheffield "smelted from one ton of peat two and one-half tons of iron which was rolled into tin plates, and proved superior to any we had before seen." In Scotland "it proved 16 per cent. better than coal." The charcoal is about half the bulk of the peat, and it being free from sulphur renders it extremely valuable in the arts, particularly for the finest steel.—Peat charcoal was used in the Bank of England for softening steel plates and dies with great and most satisfactory success. I shall hereafter treat more particularly upon charcoal of ulmin in its many useful adaptations.

As a Fertilizer, ulmin is variously treated and has as varied a reputation. Many take it directly from the "muck bed" to the barnyard depot, or to the compost heap, or spread it over the land as a manure, each of which methods are very wrong and pernicious.—The acid property of the muck bed is injurious to vegetation. It should first be spread not over twenty inches thick and be allowed to remain until the next year. The rains will wash out the acid, and the winter frosts disintegrate the mass into coarse, porous granules; in which condition it may be advantageously employed, either by spreading broadcast and plowing in, or left upon the surface, or mixing with other materials. If the manures are rich, from twenty-five to fifty per cent. of the ulmin may be mixed with them. If it be urgent to use it the same year, it should first be spread not more than ten inches thick, and after two

months' exposure, dried and ground, when it will be in a similar condition for use as by the former method.

Ulmin undergoes little or slow change where it exists in its compact and water saturated beds, but when disintegrated and mixed with the porous soil, where, from evaporation there is a constant changing of its degrees of moisture and temperature, admitting the air, the decomposition is rapid, and vast volumes of gases are evolved, the resulting elements being carbonic and oxygen gases, forming carbonic acid gas; carbonic and hydrogen gases, forming light carburetted hydrogen; hydrogen and nitrogen gases, forming ammonia; besides other gases and mixtures, all of which contribute eventually to the process of vegetation. Some of these properties furnish the plants with their own special essential of nourishment, while others serve in the decomposition of the mineral ingredients of the soil, so that they also, with the carbonic acid and nitrogen gases drawn from the air, may be in a condition to serve in the mysterious duty of completing the structure.

The formula of ulmin is—

Ulmin, (pure),...Carbon 40 Hydrogen 16 Oxygen 14
Humus, " ...Carbon 40 Hydrogen 15 Oxygen 15
Ulmic Acid,.....Carbon 40 Hydrogen 14 Oxygen 12
Humic Acid,.....Carbon 40 Hydrogen 12 Oxygen 12

The two first dissolve slowly in alkalies, unless the latter are highly concentrated. It will be seen that ulmin having parted with one equivalent of H. and O. becomes humus, and with an additional loss of H 1, O 3, becomes ulmic acid, and when parting with two more elements of hydrogen becomes humic acid, *which last* is soluble in water. In this process carbon gas is doubtless generated, which combines with the free oxygen, forming carbonic acid gas.

When this process occurs in the saturated beds of ulmin, the acids are absorbed to a considerable extent, and held by the water, the evaporation of which from year to year concentrates, and thus furnishes the raw material with that sour property so injurious to the soil, for the correction of which farmers mix lime or other alkalies in the compost heaps. I doubt, however, if this nentralized compound affords a proper benefit. It is far better to wash out the acid. The same acid will be formed in the process of decomposition in the soil, where it will perform its proper duty in disintegrating the earths, particularly those of alkaline bases, fitting them for further decomposition and solution in water.

A gentleman of extensive agricultural experience insists that he has tried "muck" to his heart's disgust, and that it "has no virtue as a fertilizer." He had used it improperly; besides, this material varies in its qualities for agricultural use almost as much as for combustion. That it certainly does possess properties beneficial for vegetation seems to me to admit of no question.

The dark color of surface soils arises from the admixture of decomposed vegetable matter—ulmin—resulting from decayed roots and plants grown on the spot or mixed with the manure applied to it. It is a powerful disinfectant, absorbing and holding ammonia and sulphuretted hydrogen which evolve in the manure heap, which it thus deodorizes. It gives up again those fertalizing specifics in its process of decomposition in the soil. As an extreme test of its deodorizing properties I placed in a flower glass two inches depth of most offensive night soil, covering it with dry and finely powdered ulmin, and fixed in it a boquet of fragrant flowers. This remained for several days on a table in the drawing-room, no one suspecting the extent to which my perhaps imprudent zeal had carried me. If sprinkled thickly over a night scavenger's cart or the surface soil of a privy, it will arrest all offensiveness.

Its hygrometric nature has a proper cooling effect on the soil, which moisture facilitates the process of chemical action on every element of it. It always is found with a good percentage of fixed ammonia, and in light loose soils it impedes filtration. Reduced to a fine powder, it readily dissolves in caustic potash, producing a beautiful clear brownish fluid; a weak solution will produce the same result but requires longer time. This coloring property when precitated with an acid becomes ulmic acid. Sugar treated with a weak solution of acid produces a similar color, which precipitated with an alkili, results in the identical substance; and this, by the slight change before shown, renders it soluble in water—a process which seems to prepare it for the plant before forming carbonic acid gas.

Distinguished and justly eminent physiologists believe that but a trifling percentage of the carbon of plants and trees is derived from elements in the soil, the chief source of the supply being from the air through the medium of the roots and branches. I confess this theory does not always seem tenable to me; while many believe more carbon is absorbed by the leaves than is drawn from the roots, I see no reason why that heavy gas should not permeate the earth from the air and be taken up by the roots, as well as the asserted trifling proportion alleged to be furnished from the vegetable decomposition in the soil. This latter agency appears to me to be immensely underrated. All admit that the alkaline and silicious, as well as all other mineral properties, arise solely through the roots in watery solutions. Now, why not carbon as a fluid as well as in gas? While the tree is growing the sap travels upward through the capillaires, depositing its burthens of matter for digestion and organization in forming wood, the water passing off through the leaves, which are alleged to absorb carbon through the day and evolve it at night. I admit my presumption in questioning the truth of a theory so widely adopted, yet so imcomprehensive to me, and my justification aside from that fact is the varied and contradictory theories upon this as well as other important phenomena in vegetable life.

All saps contain the elements of carbon, sugar consisting of little else than carbon and water. A lump of sugar placed on a hot plate first liquifies, because the heat disengages the water of crystalization which passes off in puffs of steam, leaving charcoal; and by a wet process; place a lump of sugar in a tumbler, and upon it let fall a few drops of sulphuric acid; the water having a greater affinity for the acid than for carbon will go to it, leaving charcoal as before, and by carefully washing out the acid and filtrating, the carbon will be collected as an impalpable black powder.

It is unreasonable to suppose that the copions sugar-laden sap of the maple (which flows for weeks in the early spring from a tree that has been bled for years and years with no visible impoverishment to it,) has been pent up in its cells for an entire winter, and is set free at a time when the buds have not even expanded, and the earth is still covered and sealed with snow that rests upon compact ice. Can carbon gas absorbed through the leaves of a gigantic elm or oak be believed to traverse its branches to form the wood of the trunk at its base, when it is well known that the sap current is always upward? or that the early carbon-laden sap has obtained its supply from the carbonic acid gas that has been sealed up all winter in the soil?

I will, however, now give a variety of quotations on this subject from standard works, to illustrate the complexity of opinions.

"The atmosphere is the great storehouse from which trees receive their nourishment."

"The requisite materials exist in the air."

"The air, therefore, must have furnished *the whole*, which conclusive evidence is amply confirmed by a variety of familiar facts, such as the accumulation of vegetable matter in peat bogs."

"The carbon is conveyed only through the medium of carbonic acid gas, which is derived *solely from the air*."

"Leaves exhale the moisture absorbed by the roots, and contain a much larger per cent. of alkali and less carbon than the wood."

"It is admitted that the mineral constituents of plants are furnished from the soil, having been dissolved and taken up by the water, and then absorbed by the roots."

"The farmer in removing his annual crops, robs the land of its supply of nourishment from the decay of the previous years, containing not only the alkaline, but the carbon elements, which must be supplied artificially by manure."

"The mode by which the vegetable world is turned to account by growing plants, has not yet been sufficiently investigated."

A world renowned European writer says—"Some virgin soils, such as those in America, contain vegetable matter in large proportions, to which the term humus has been applied. Indeed, this particular substance appears to play an important part in the phenomena of vegetation, and the fertility of that soil is ascribed to its presence" * * * "It is itself the product of decay of vegetable matter, and must therefore contain many of the constituents which are found in plants during life."

"In the form in which it exists in the soil it does not afford the slightest nourishment to plants."

Neither do alkaline earths, nor any of the elements of vegetable growth. All must undergo some chemical changes before they are fitted to be absorbed by the roots, after which still further changes are requisite in their transit through the root and the superior structure to fit them for organic employment.

"Both the cold of winter and heat of summer are destructive to the solubility of humic acid, and at the same time of its capacity of being assimilated by plants, so that if absorbed by them it must be in some other form." * * * "Humus does not nourish the plant by being taken up in its unaltered state, but by presenting a slow and lasting source of carbonic acid, which is absorbed by the roots, and is the *principal* nourishment of young plants, as when destitute of leaves they are unable to extract it from the atmosphere."

"Plants which live in a soil containing humus exhale much more carbonic acid gas during the night than those which grow in dry situations. These facts point out the cause of numerous contradictions, but they are unworthy of consideration, as they do not assist in the solution of the main question."

In proof that plants derive their supply of carbon direct from the air, reference is made by the same distinguished author to "that period of the earth's history when there was no vegetation, and consequently there could have been no humus."

At that—the third—era in the earth's formation, when its first or incipient elements of unmixed gases—a cloud of shapeless vapors floating in space—had been changed by surface condensation, chemical affinities, aggregation and consequent heat, to an elliptical form with a plastic crust that thickened or deepene and solidified as the heat evolved. The bulk consequently decreased, contracting in vast wrinkles and rents, forming hills and valleys of sterile rock.

Now came earthquakes, lightning and thunder, uniting hydrogen and oxygen in the atmosphere, and down came the first water in rain floods, cooling and disintegrating the surface of the hill tops and sides, carrying to the valleys the debris of mud saturated with carbonic acid gas, which then composed a large proportion of the atmosphere, thus forming the first and truly virgin soil.

From this soil started that gigantic and quick maturing vegetation composed so highly of carbon and hydrogen, which growing into that atmosphere of dense poison, that under its volume of pressure was continually forced into the soil as the plant absorbed it, and thus robbed the atmosphere in a great degree of its carbon, leaving the oxygen and nitrogen free to form "air," and by the rapid decomposition of those plants the carbon was locked and bottled up in oil springs and coal fields. By subsequent disintegrations, dissolutions, and aggregations, other larcenies were perpetrated on this early carbon gas to form carbonate rocks of lime and other minerals, which together, at last fitted the earth for habitation by animals and man, who learned only in the eighteenth and nineteenth centuries the final applicability and duty of those mediums for contributing so vastly to his comfort, usefulness and wealth.

That this is pertinent to our general subject, I shall endeavor to show. It clearly seems that the above described geological phenomena would then produce the precise results to that first vegetation which modern enterprises and researches have developed—that the first soil was *mud* and its bulk in small proportion to that of water. Consequently the first plants were aquatic, or those which grew in, and chiefly under water; and, following the same laws as do water

plants of the present time, they decomposed, the water absorbing the hydrogen and liberating the oxygen; while both the soil and water being saturated with carbon gases they were assimilated by the plants in which hydrogen predominated, which, in their decomposition, left *petroleum*.

The process of forming and precipitating water, and decomposing the rocky surfaces continued, and was augmented by rains resulting from evaporation and condensation, until the bulk or depth of the soil had shallowed the waters, some of which was doubtless drawn off into newly formed and deeper valleys.—Then came forth a new genera of plants, which growing into the atmosphere that was, with the soil, still saturated with carbon gases but without the source of hydrogen, formed plants in which carbon predominated, and in their decomposition produced *mineral coal*. It is quite probable that the plants forming bituminous coal grew in a moist soil, and those forming anthracite from one holding less water, which seems to me a more reasonable theory than that the latter has lost its bitumen by any mechanical or chemical dispersion or assimilation.

It seems that the combustion of those early concentrated carbons liberates for the nourishment of modern vegetation the virgin carbon gases which have been imprisoned since the creation.

The plastic crust continued and alternated its folding waves. The disintegration of rocks and formation of soil went on. New formations of matter aggregated and solidified from the former ruins, and which in their turn were disintegrated into soil with new elements. The atmosphere was purified, and slow-growing, mineral-absorbing plants sprung forth, which in their decomposition leave *ulmin*.

Nature, in her process of construction, destruction, and re production, employs always the same elements. Carbonic acid gas, the great medium of vegetable growth, is the most destructive of all known poisons to animal life if taken into the lungs, while they, as well as the surface pores, evolve it in incredible volumes.—Carbon is produced by vegetation in a condition for animal nourishment, and forms a great proportion of animal matter. All vegetable and animal matter in its process of decomposition gives back again free carbonic acid gas, to serve anew in its proper and primary duty to the organic world.

To be resumed.

Loss in Smelting.—Not less than 800 tons of lead were recently obtained in one year, the result of the dust which accumulated within that time in the long flues of a smelting furnace in the north of England.

New York, April 2, 1866.

	Bid.	Asked		Bid.	Asked
Copper Stock.			***Gold Stock.***		
Aztec	7		Benton	1	1¼
Bedford	1	1	Consol'd Gregory		28¾
Boston	4½	5	Corydon	—	3
Caledonia, A. P.	10	12	Gunnel	3¾	4½
Canada	3¼	4	Great Western	—	8
Carp Lake	3	5	Hope	—	9
Central	—	—	Isaac's Harbor	¾	⅞
Columbian	—	24	Manhattan	—	9
Copper Falls		—	Mariposa	44	44¾
Clifton	—	81	Montana	½	1
Dacotah	—	5½	New York	2½	3
Derby	⅞	1½	N. Y. & Nova Scotia	½	1¼
Douglass	—	—	Quartz Hill	9¼	10
Evergreen	18¾	20	Quicksilver M'g Co	81	82
Flint Steel River	12	13½	Rocky Mountain	—	10½
Frue	2¾	5	Smith & Parmelee	7	12
Grand Portage	—	—	***Coal Stocks.***		
Hancock	12¾	14	American	98	100
Hamilton	—	6	Ashburton	—	25
Hilton	5	6	Central	62	65
Hudson	1	2	Cumberland	61	62
Huron	32	33	Del. & Hud. Canal	206	208
Indiana	8¾	9¼	*Hampshire & Balt.	104	110
Isle Royale			Pennsylvania	213	215
Keweenaw	—	6	***Lead Stocks.***		
Knowlton	7	10	Bucks County	⅝	¾
Lafayette	1	2	Clute	1½	1¾
Manhattan	—	—	Erie	—	20
Mendota	—	—	Macomb	3½	5
Merrimac	4¾	5½	Plancentia Bay	1¾	1¾
Minnesota	33	37	Sussex	¾	⅞
New York, A. P.	2	3½	Wallkill	3½	6
N. J. Consolidated	4	4¾	***Iron Stocks.***		
Norwich	—	6	Copake	8	10
Ogima	5	6¾	French Creek	⅝	1
Ontonagon	3	4¼	Teal Lake	4½	6
Penn	—	11½	***Miscellaneous.***		
Providence	1¾		Rutland Marble	17	20
Quincy	96¾				
Reliance	1¾				
Rockland	12¾				
Superior	8¾				
Sharon Consolidated	—				

* Ex. div.

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Leave from pier No. 15 North River, (Liberty Street,) daily at 6 a. m. for Easton, Mauch Chunk, Williamsport, Wilkesbarre, Mahanoy City, &c. Mail train at 8 a. m. for Flemington, Epston, Water Gap, Scranton, Wilkesbarre, Great Bend, Pittston, Binghampton, &c., 9 a. m. Western Express for Easton, Allentown, Harrisburgh, Pittsburgh, and the West, with but one change of cars to Cincinnati or Chicago, and but two changes to St. Louis. 12 m. for Easton, Allentown, Mauch Chunk, Reading, Pottsville, Harrisburgh, &c. 4 p. m. for Easton, Scranton, Great Bend, Bethlehem, and Mauch Chunk. 5 p. m. for Somerville and Flemington. 6 p. m. Express Train for the Oil Region and Erie, via Mauch Chunk and Williamsport, daily, except Saturdays. 6·30 p. m. for Somerville. 7 p. m. for Somerville. 8 p. m. Western Express for Easton, Allentown, Reading, Harrisburg, Pittsburg, and the West. Sleeping cars through from Jersey City to Pittsburg every evening.

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Depot Foot of Cortlandt St.

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For Baltimore, 8 and 10.00 a. m. and 6, 7, p. m. and 12 Midnight.

For Washington, 8, and 10,00 a. m. and 6, 7 p. m. and 12 Midnight—Through ticket sold and baggage checked for the West, on 7 a. m. and 6 p. m. trains.

For Newark, 6, 6.30, 7.30, 8.10, 9, 10, 11, and 11.40 a. m., 12 m, 1, 2, 3.20, 3.40, 4.10, 4.30, 5, 5.10, 5.20, 5.40, 6.10, 7, 8.20, 10, and 12 p. m.

For Elizabeth, 6, 7, 8 10, and 10 a. m.; 1, 2, 3.20, 3.40, 4,10, 4.30, 5, 5,10, 5.40, 6.10, 7.10, 8 20, 10 and 12 p. m.

For Rahway, 7, and 10 a. m. and 12, 2, 3.20, 4.10, 5.10, 5.40, 7.10, and 12 p. m.

For New Brunswick, 7, 8, 10, and 11.30 a. m.; 12 m. 4, 4,10, 5.10, 6, and 12 p. m.

For Millstone, at 8 a. m.; 2.15, and 4.10 p. m.

On Sundays trains leave New York for Philadelph'a and intermediate stations at 6 p. m. and for Washington, 7,00 p. m.

Military tickets will not be received in the 8 a. m. or 7 p. m. trains.

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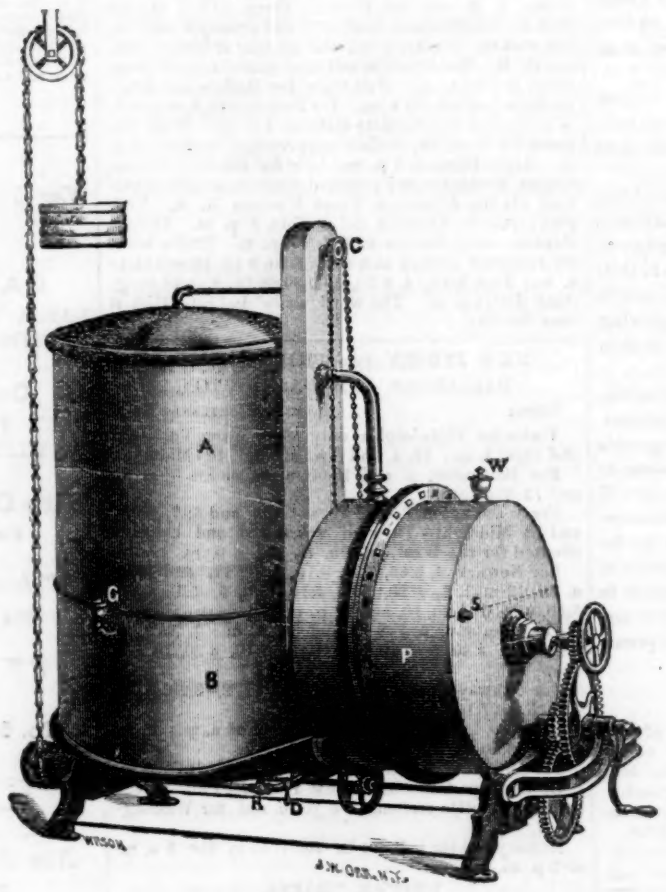

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CERTIFICATE.

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FLOYD'S PATENT

Malleable Iron Retort Lid.

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Furnace Door and Frame.

Refers to—J. A. Sabatton, Esq., Engineer Manhattan Gas Co.—Col. A. J. White, Metropolitan Gas Co.—C. C Mowton, Engineer New York Gas Light Co.—J. Mowton Saunders, Engineer Baltimore Gas Co.—John T. Harrison, Engineer Savannah Gas Co.

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CHEAPER THAN COAL OR WOOD.

The "EAGLE" Gas Heating

STOVES,

Positively guaranteed free from Smoke or Smell.

Will Heat Offices, Parlors, Dining, Sleeping, and Bat Rooms. Also,

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COAL OIL STOVES,

For Cooking and Heating.

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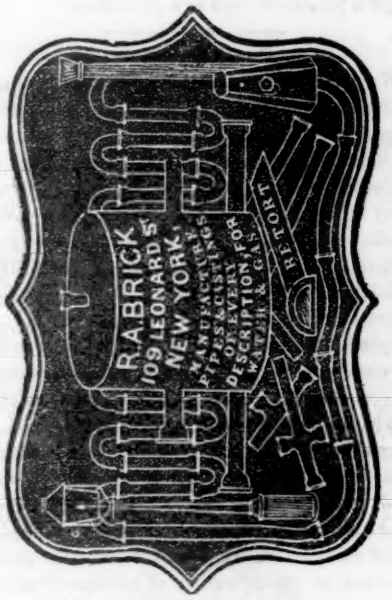

OFFICE 109 LEONARD STREET, NEW YORK.

AND BANDS COMPLETE.

The Mining and Petroleum Standard

AND

AMERICAN GAS-LIGHT JOURNAL,

PUBLISHED ON 2D AND 16TH OF EVERY MONTH.

JAMES W. BRYANT, } EDITORS.
M. P. CALLENDER, }

MONDAY, APRIL 2, 1866.

THE MINING & PETROLEUM STANDARD AND AMERICAN GAS-LIGHT JOURNAL, is published at Tribune Buildings, No. 1 Spruce St. on the 2d and 16th of every month, and is a recognized official organ of—

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PETROLEUM, WATER-SUPPLY, AND

SCIENTIFIC SUBJECTS GENERALLY.

JAMES W. BRYANT, PROPRIETOR.

M. P. CALLENDER, PUBLISHER.

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☞ *Private Office, No.* 111 *Pearl street.*

☞ The Office of this Journal will be removed on the FIRST OF MAY to 22 Pine Street, to which place all letters or communications for the paper should be addressed.

☞ Our subscribers would confer a favor upon us by remitting *checks, or Post Office Money orders*, as we are frequent losers by money sent by mail.

☞ We should be pleased to make our journal an organ of intelligent discussion for those of our subscribers and readers who may wish to gain, or give information on the subjects to which our columns are devoted. We solicit letters from those who make the study of gas a pleasure as well as a profession.

Gas Inspection.

We publish in another place a synopsis of an act of the Legislature of Ohio, looking to the protection of gas consumers and protection and regulation of gas light companies. That the bill possesses some merits we shall not deny, but we question the propriety of legislative interference in matters of which legislators have little or no practical knowledge, and matters that are best regulated by the laws of trade. Legislators think—and we must confess, with some degree of reason,—that gas companies are fair game for plucking, and they more or less deserve it for not employing respectable talent to take charge of their works. Many of them when questioned about meters, their operation, etc., can hardly give an intelligent answer, and as a natural consequence the public imagine there is ample opportunity to defraud, and as a result the legislature is resorted to as a medium through which to correct wrongs that do not really exist. They do not know the extreme exactness of the operation of meters—rivaling in the nicety of their workings the best time-keeper—that they cannot be moved by external application, that their action is altogether by the internal operation of the gas in passing the screw propeller-like wheel of the wet and the piston arrangement of the dry meter, and if they take the trouble to seek such information from employees or even officers of gas works, they are frequently turned off with unsatisfactory or insolent answers, which, while perhaps covering their own ignorance, but serve to increase the distrust and dissatisfaction of the enquirer. Consumers, too, are not free from blame for many of the real or fancied grievances of which they complain. They too often seem to think that the meter which registers their gas and for which they pay rent, is placed on their premises merely for the benefit or convenience of the company, when the fact is it is placed there as a guardian of the rights of both consumer and provider equally alike, and will never fail in this duty if equally referred to by both. One general complaint from consumers is that their gas bills for different months are uniform in amount whether they consume much or little, and they therefore charge that they are the victims of fraud, extortion, etc., to those "monstrous monopolies," the gas companies; and so they continue to complain, become careless of the amount of gas they use, and many times are really imposed upon, and all this when the fault and the remedy both lay with themselves and not with the gas company. The fault lies in neglecting to give proper attention to your meter, and the remedy in the reverse. If you are careless in this respect, the employee of the gas company whose duty is to take and report the state of your meter will many times take advantage of such carelessness, and instead of performing his duty spend the time it would require more to his own liking, and makes his report to correspond in amount with the one preceding, with perhaps slight variation more or less to avoid suspicion, and the bill is sent in which you are necessitated to pay because you neglect to summon the witness who stands ready to testify in your favor—your meter. Again an amount of gas in excess of what has been actualy consumed may be registered by the meter, in which case the fault will be found not in the meter, but in the pipes connecting it with the burners having become defective in the joints or elsewhere, allowing the gas to escape.

By visiting your meter once in a month at the time the servant of the company takes the state of it, and taking down on paper the figures as indicated on its dial, you have the evidence to protect you from imposition through the neglect or incompetency of such servant; and referring to it occasionally in the morning and again at night, no gas being burned in the interval, will prottect you against loss by accidental waste, which will then be discovered and prevented instead of being allowed to enlarge your gas bills month after month.

When gas companies will employ servants who can give intelligent answers to civil questions, and consumers will exercise that information for their own benefit, we shall hear far less complaints of gas monopolies and extortion, and have less legislation in regard to it than at present.

☞ M. Frantz, metallurgist, and M. Henri Faure, editor of the *France Medicale*, hove announced that they have discovered a method for transmuting silver, copper and mercury into gold, all these, they say, being one and the same metal in different dynamic states. This idea is quite in accordance with that of the old alchemical writers on the subject; and the posibility of transmuting metals has been admitted by Sir H. Davy, Dr. Faraday, and other eminent modern chemists. Whether in this case, it has really been done, however, we confess to have our doubts.

Dimensions for Service Pipe.

We are under obligations to Doctor W. H. McFADDEN, of Philadelphia, author of the "Gas Superintendant's Pocket Companion," referred to by our correspondent "G," in the last number of the JOURNAL, for a copy of that work, and also for the following information in answer to the inquiries of the same correspondent:

MESSRS EDITORS:—For your information I call your attention to the following quotation from "Hughes on Gas Works," page 272—"For instance, the formula used by Mr. Clegg would give more than double the true quantity delivered when applied to a pipe half an inch in diameter, and when applied to a main 26 inches would give a result less than one-third of the true discharge from this main." Again, quoting from page 275—"For those, however, who are disposed to place confidence in Mr. Clegg's experiments, to the exclusion of others, it will be readily competent to derive a coefficient from Mr. Clegg's experiments," &c., &c.

The formula which Mr. Pole proposes for gas is 1350 $D^2 \sqrt{\frac{H D}{1.9}}$ Hughes, page 276, while Mr. Hughes suggests 1335. Mr. Pole, on page 276 of Hughes, adds "That in some recent experiments on a 9 inch main giving the discharge under different pressures, the results would require his coefficient to be reduced to 1150;" but goes on to say that "it would not be judicious to adopt such an alteration for general use unless confirmed by other experiments on pipes of different diameters."

Among such eminent engineers we find differences, and in the Companion we have followed the formula of Mr. Pole as the safest, for if in error, it is erring on the safe and practical side.

Yours very truly,

WM. H. MCFADDEN.

A Valuable Invention.

Our attention has been recently called to what we have no doubt will prove a very valuable invention, by GEORGE W. EDGE, Gas Engineer, Jersey City, and will be very generally adopted by Gas Companies, which has for its object the removal of carbonaceous incrustations from the interior of clay retorts. The chief difficulty in using clay retorts is the accumulation of carbon which is deposited on the inner surface, which forms a non-conducting incrustation, rapidly diminishing their capacity, and necessitating its removal, which difficult operation has been performed to the great detriment and frequently complete destruction of the retort. These objections are entirely overcome by the inventor, by whose process the carbon is removed from the interior surface without affecting the carbon in the body of the retorts, which is necessary to prevent the leakage of gas through pores and cracks that it fills; their durability is prolonged for an indefinite period of time; a very small per centage of retorts is required to be out of use; the expense as compared with the present process is greatly diminished; the carbon is burned out instead of being removed by chipping bars, or other appliances; the productiveness of the retorts is largely increased, rendering a clay retort all that can be desired for the purpose of generating gas. This accomplished, and the cost of manufacture is lessened, which will proportionably cheapen the commodity to the consumer, and in this light the invention of Mr. EDGE, and all others looking to this end, will be gladly welcomed both by gas companies and the by public.

☞ It is proposed to amend the law of New York, relating to the storage of petroleum in cities so that the oil shall not be kept in casks holding over 45 gallons, and shall not be over 110 degrees fire-temperature.

The attention of our readers is directed to the advertisement of Perce's Magnetic Globes, in another column. Their superiority is manifest.

Desulphurizing Coal.

Mr. Charles F. Dennet, who was for 12 years the active agent of Colt's Fire-arms Factory Company in England, is about introducing a new method for the treatment of coal, which has been pronounced a decided success. The coal prepared by the new process, which is very simple and cheap, is said to be far superior to coke for melting iron, etc. A much hotter fire can be made with it than with coke.—Cast-steel heated with coal thus treated has been welded without the use of borax or other ingredients. Pig-iron which has been proved too hard, has been found to yield and produce as good work as turned out with the best brands of iron. Crystallised iron, after melting once or twice in a cupola with the desulphurized coal prepared by the new art, has been found to work exceedingly well. The whole apparatus and ingredients for treating 100 bushels of coal can be put up for from £5 to £10, and it is asserted that 60 bushels prepared by this process give as much heat as 85 bushels of the best coal not so prepared. The coal burns with a bright and violent blaze, and for family use effectually gets rid of the smoky, smouldering fire, and substitutes one of a bright and cheerful character. To smiths and manufacturing establishments, where large and strong fires are kept up, it is proposed to grant rights for usage at such low rates as to ensure its general adoption, and do away, in a great measure, with the smoke nuisance so injurious everywhere.

IMPORTANT NOTICE.

To Advertisers.—Our paper offers a superior medium as an advertising agent, to all those who manufacture or sell machinery or appliances of any kind for Gas, Mining, Water, Sewerage, the production or purification of Oils, &c. &c., not so much on account of a wide-spread circulation, as from the fact that it goes directly to the hands of those who are constantly using and requiring machines and improvements for these branches, and who look through our columns for information where to procure them. The class of people who read our paper not only peruse our pages of reading matter, but read the advertisements as well, for the reason that they are directly interested in all things pertaining to their business. We therefore ask, with confidence that we can do them justice, all parties having machinery or improvements of any kind for either of the objects to which our paper is devoted, to send in their advertisements and avail themselves of these advantages. It will be observed that our terms for advertisers are very reasonable.

THOMAS CASSIDY,

Iron Founder & Pattern Maker

Corner Hudson and Park Avenues,

BROOKLYN.

Iron Store Fronts put up at short notice.

Square and Round Columns, Truss Girders, Vault Beams, Window Lintels, Sills, &c.

A large assortment of Railing Castings constantly on hand, or made to order, at the shortest notice.

Lamp Posts—Brooklyn Pattern.

☞ A large stock of the usual sizes of Round Columns kept on hand.

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VALVE WATER METER,

(Used also for Oil and Liquors,)

is now in use by many City Water Cos., because of its low price, simplicity, durability, accuracy under any pressure, and (a great advantage) because it runs with less head than any meter used. Manufactured by

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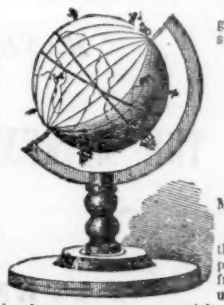
AND

PERCE'S MAGNETIC OBJECTS.



A beautiful Terrestial Globe, elegantly mounted and colored, and supplied with

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MAGNETIC LADIES,
MAGNETIC SHIPS,
MAGNETIC STEAMERS,
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MAGNETIC LIONS,
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MAGNETIC LIGHTHOUSES,
etc., etc., forming a
MINIATURE MAGNETIC WORLD.

Perce's Magnetic Globe has won the warmest ecomiums from the press; from men of science, and from all lovers of the beautiful and useful in science, in art, wherever it has been seen. As an article of HOUSEHOLD FURNITURE, it is elegant and useful; "as useful," says the New York *Independent*, "for the entertainment and instruction of the little ones at home as the piano, or any other instrument for domestic amusement and instruction."

"Perce's Magnetic Globes and Magnetic Objects afford a wide field for many pleasing and surprising experiments; and with it, aided by the explanations which accompany it, our young readers will be able to conjure up many interesting illustrations and games which they will find profitable and amusing."

STYLES AND PRICES.

Perce's Magnetic Globe, 5 in. dia., Plain Stand,	$ 5
Perce's Magnetic Globe, 5 in. dia., Brass Meridian,	7
Perce's Magnetic Globe, 7 in. dia., Plain Stand,	10
Perce's Magnetic Globe, 7 in. dia., Brass Meridian,	25
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The Globes of all the above sizes and styles are finished in the highest style of the art, are mounted on polished black walnut stands, and will form an elegant and attractive ornament for the parlor, library or drawing-room.

One dozen of Perce's Magnetic Objects, with plainly written directions, accompany each globe without additional cost.

All Globes and Objects are packed neatly in boxes, and will be sent safely any distance by express, freight paid, on receipt of price.

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Manufacturer of all kinds of GAS and WATER PIPE, BRANCHES, CONNECTIONS, T's, ELBOWS, and ALL CASTINGS USED AT GAS AND WATER WORKS.

I offer special inducements to parties wishing to purchase, as my Pipe is Smooth, regular in weights, and cast vertically.

N. B.—Pipe from 3-inch and upwards, cast in 12-ft. lengths.

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SAN JACINTO,
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Cooking Apparatus.

All the cooking for a family can be done with Kerosene Oil, with less trouble and at less expense than by any other fuel.

Our stoves give no smoke or odor, and are not liable to get out of order, being as simple in every respect as a kerosene lamp. The Baker, Boiler, and Flat-Iron Heater are the only special articles of furniture required. For all other purposes, ordinary stove furniture may be used.

We would call attention to the fact that for the past three years, the Company has devoted itself almost exclusively to the manufacture of Kerosene Cooking Apparatus, and is prepared to guarantee that every article shall perform all that is claimed for it.

Liberal discounts to the trade. Send for circulars and price list.

KEROSENE LAMP HEATER CO.,

206 Pearl Street,

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AMALGAM BELLS,
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275 "	42	69 00	18 00	87 00
375	36	94 00	22 00	116 00
450	34	112 00	25 00	137 00
600	02	150 00	30 00	180 00
750	39	188 00	35 00	225 00
1,000	64	250 00	42 00	292 00
1,200	48	300 00	45 00	345 00
1,400	50	350 00	50 00	400 00
1,600	52	400 00	54 00	454 00
1,800	55	450 00	60 00	510 00
2,000	58	500 00	62 00	562 00
2,500	60	625 00	72 00	697 00
3,000	63	750 00	85 00	835 00
3,500	66	875 00	87 00	962 00
4,000	69	1,000 00	100 00	1,100 00
4,500	72	1,125 00	113 00	1,238 00
5,000	75	1,250 00	125 00	1,375 00

List of Prices, Weights, and Sizes of Farm, Hotel, Steamboat, Schoolhouse, Shop, and Factory Bell.

These Bells are fitted with Yoke, Standard's Crank and Bolt, complete for use.

Weight of Bell and Hangings.	Diameter.	Cost of Bell and Hangings complete.
15 lbs.	7 inches.	$3 75
20	8½	5 00
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50	12	12 50
75	16	18 75
100	18	25 00
150	20	37 50
200	22	50 00
250	24	62 50

Larger Sizes made to Order at 25 cents per pound.

Guarantee.—All Bells sold at the above prices WARRANTED against breakage by fair ringing, for TWELVE MONTHS from time of purchasing. Should one fail, a new bell will be given by returning the broken one.

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In case a Bell breaks after the expiration of the Warrantee, I allow HALF PRICE for the old metal.

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AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. revents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many f the largest gas companies in the United States; which companies having thoroughly tested its operties as herein claimed, pronounce in its favor over any other paints in the market, even though d at double its price.

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For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, ouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Five Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

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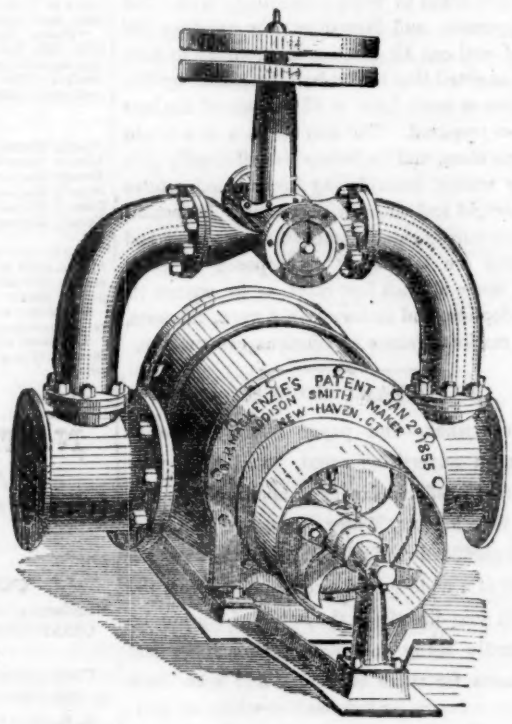

They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the tion and illuminating power of the gas, and add very much to the durability of the retorts, clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durcleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. Address

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GAS APPARATUS

For Country Residences, Public Buildings, &c.,

FROM $300 UPWARDS.

EVERY DESCRIPTION OF GAS FIXTURES.

Gas Fitting in all its branches

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SAVING OF FUEL TO PARTIES USING STEAM.
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Guaranteed to effect a great saving in fuel and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms or flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 117 Broadway, New York.

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PIG IRON & CAST IRON GAS & WATER PIPES.

Also, Heavy & Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.

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POOLE & HUNT,

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GAS-HOLDERS,
IRON-ROOF FRAMING,

And other descriptions of

Iron Work for Gas-Works, Water-Pipes, and Heavy Castings, and Machinery generally.

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Manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues, GALVANIZED WROUGHT IRON TUBES,

ARTESIAN WELL PIPES,

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Retorts, Bench Castings, Condensers, Washers Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gas holders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam & Hand Air Pumps for providing Street Mains Centre Seals, Governors, Wrought or Cast-Iron Line Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.

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42 Cedar street. [2,500.000.]
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CHERRY CREEK FARM PET. CO.,
8 & 10 Wall street. [$2,000,000.]
L. G. Capers, Pres. J. A. Ferguson, Sec.

CENTRAL PETROLEUM CO.
10 Pine street. [$5,000,000.]
J. Bishop, Pres W. W. Clark, Sec.

GERMANIA PETROLEUM CO.,
33 Pine street, [$3,000,000.]
J. F. Schepeler, Pr. C. Throckmorton, Sc

GREAT WESTERN CONSOLIDATED
27 Wall street. [$4,000,000.]
F. A. Van Dyke, Jr. Pr. F. W. Potter, Sy

GREAT NORTHERN PETROLEUM,
67 Exchange Place. [$2,000,000.]
J. Bryan, Pres. J. A. Wisner, Sec.

HOFFMAN PETROLEUM CO.
10 Pine street, [$5,000,000.]
G. W. Abbe, Pres. J. P. Hogarth, Sec.

HOME PETROLEUM CO.
10 Pine street. [$5,000,000.]
Josiah Oonkes, Pres. E. Dwight, Sec

JOHN ANDERSON PET. CO.
106 Broadway, [$2,000,000.]
A. G. Curtin, Pres. E. O. Perin, Sec.

LITTLE KANAWHA & ELK RIVER,
61 Cedar street, [$6,000,000.]
O. E. Wood, Pres. J. Wadsworth, Sec.

OIL CITY PETROLEUM CO.
8 Pine street, [$500,000.]
D. S. Duncomb, Pres. C. C. Pinckney, Sc

PACIFIC COAST PETROLEUM CO.
71 Broadway. [$5,000,000.]
J. De Peyster Ogden, Pres. L. Benton, Sc

RATHBONE OIL TRACT PET. CO.
69 Wall street. [$5,000,000.]
J. P. G. Foster, Pres. A. L. Purves, Sec.

RYND FARM PETROLEUM CO.,
8 Broad street, [$2,000,000.]
S. J. Macy, Pres. J. F. Jenkins, Sec.

SECOND NATIONAL PET. CO.,
100 Broadway. [$3,000,000.]
M. S. Frost, Prest. J. M. Bruce, Jr., Tr

TARR FARM PETROLEUM CO,
61 Cedar street. [$3,000,000.]
J. Wadsworth, Pres. C. W. Ware, Sec.

UNITED REPUBLIC PET. CO,
74 Broadway. [$2,500,000.]
E. J. Lowber, Pres. J. H. Kidder, Secy.

UNITED PETROLEUM FARMS CO.
10 Pine street. [$10,000,000.]
G. H. Bissell, Pres. J. P. Hogarth, Sec.

VIRGINIA & OHIO PETROLEUM CO.
51 Broad street. [$1,000,000.]
B. Schieffelin, Pres. E. Siebeer, Sc.

WINONA PETROLEUM CO.
5 William street. [$1,000,000.]
J. N. Tappan, Pres. J. D. Fish, Treas.

WEST VIRGINIA OIL & COAL CO.
71 Broadway, [$3,000,000.]
A. F. Ball Pres. F. A. Miller, Se.

Great Improvement
IN
Sewing Machines.
EMPIRE
SHUTTLE MACHINE!

Patented February 14th, 1860.

Salesroom, 536 Broadway.

This Machine is constructed on entirely new principles of mechanism, possessing many rare and valuable improvements, having been examined by the most profound experts, and pronounced to be SIMPLICITY and PERFECTION COMBINED.

It has a straight needle, perpendicular action, makes the LOCK or SHUTTLE STITCH, which will NEITHER RIP nor RAVEL, and is alike on both sides; performs perfect sewing on every description of material, from Leather o the finest Nansook Muslin, with cotton, linen, or silk thread, from the coarsest to the finest numbert.

Having neither CAM nor COG WHEEL, and the least possible friction, it runs as smooth as glass, and is

Emphatically a Noiseless Machine!

PRICE OF MACHINES,
COMPLETE:

No. 1, Family Machine, with Hemmer, Feller, Gauge, Braider, & Corder, complete. - - - $60
No. 2. Small Manufacturing, with Extension Table, $75
No. 3. Large Manufacturing, with Extension Table, $85
No. 3. Large Manufacturing, for Leather, with Rolling Foot and Oil Cup, 100

One-half hour's instructions is sufficient to enable any person to work this Machine to their entire satisfaction.

Agents Wanted in all Towns in the United States, where Agents are not already established. Also, for Cuba, Mexico, Central and South America, to whom a liberal discount will be given Terms, invariably CASH on delivery.

T. J. McARTHUR & CO.,
536 Broadway.

WILCOX & GIBBS SEWING MACHINE

It is entirely noiseless.
A patented device prevents it being turned backward.
The needle cannot be set wrong.
It received the Gold Medal of the American stitute in 1863.
InSend for a circular containing full information, notices from the press, testimonials from those using the machine, &c.

JAMES WILLCOX,
Manufacturer, 508 Broadway, New York
Principal Offices:
NEW YORK—508 Broadway.
BOSTON—323 Washington street.
PHILADELPHIA—720 Chestnut street.
CHICAGO—133 Lake street.
CINCINNATI—70 West 4th street.
LONDON—135 Regent street.
HAMBURG—44 Hermann street.
PARIS—82 Boulevard de Sebastopol.
ST. PETERSBURGH—15 Gorochovay.
VIENNA—9 Wildpretmarket.
BRUSSELS—12 Rue Croisade.
SYDNEY, AUSTRALIA—292 Pitt street

GAS-BURNERS.

T. G. ARNOLD,
MANUFACTURER OF
GAS-BURNERS
And Importer of SCOTCH TIPS,
224 and 226 West 21st street,
formerly No. 447 BROOME ST.,
New York.
Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers, &c., &c.

C. GEFRORER,
Manufacturer of
GAS-BURNERS,
For Lighting and Heating Purposes.
GAS HEATING AND COOKING APPARATUS; FITTERS' ROVING APPARATUS, &c.
529 Commerce st., bet. Market & Arch, Philadelphia.

WOODEN PURIFYING TRAYS
PATENT
Conically Slotted Solid Wood Sieves
FOR PURIFIERS.

The Conically Slotted Solid Wood Tray or sieve was patented 21st October, 1862, and all persons are cautioned against purchasing them of any other person except the subscriber. The following companies are now using these trays.

Manhattan, New York,
Metropolitan,
New York
Albany,
Troy
Brooklyn, L. I.
Williamsburgh,
Citizens
Baltimore Md.
Louisville, Ky.
Chicago. Ill
Cambridge,
And numerous others

Orders eceived by mail or otherwise.
JOHN L CHEESMAN.
147 Avenue C New York City

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.
J. D. WEST & CO.,
No. 40 Cortland street,

JOSEPH LENNIG,
1615, 1617, and 1619 Francis St.,
Above Ridge Avenue, Philadelphia, Pa.,
MANUFACTURER OF
WET & DRY GAS METERS,
STATION, SHOW, & EXPERIMENTAL METERS,
Photometers, Pressure Registers, Indicators, and Gauges, Governors, Meter Provers, Centre Seals, Fluid Gauges, &c.
GAS APPARATUS
Of the most reliable and approved construction manufactured and on hand at the
UNION GAS METER WORKS.

D. PARRISH, Jr.,
GAS ENGINEER
And Contractor for Coal or Oil Gas-Works.
Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.
205 1-2 Walnut st., Philadelphia, Pa.
Box 1956, Post Office.

To Manufacturers of Petroleum Gas.

For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.

Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

TO GAS COMPANIES.

THE UNDERSIGNED DESIRES TO undertake the supervision of several small Gas-works, to visit and examine them as often as may be necessary; to obtain and inspect their coal, castings, fire-brick, and other materials; and to manage their general business in such a manner that they shall be under such supervision as is now attainable in large works, at much increased cost. Also, to advise as general Consulting Engineer and expert in practical chemistry.

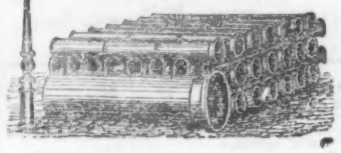
CHAS. M. CRESSON,
Late Asst. Engineer of the Philadelphia Gas-works
417 Walnut st., Philadelphia.

THE AUBIN
GAS-WORKS COMPANY,
Of Albany, N. Y.,

Now contract their works to make 10,000 feet of good Gas from 2,000 pounds of *hard* wood and 40 gallons of kerosene tar, *before payment can be demanded;* and the charcoal is worth the cost of the wood.

Many Village Gas Companies can be referred to.

R. D. WOOD & CO.,
MANUFACTURERS OF
CAST-IRON PIPE, RETORTS, &c.
Office, 400 Chestnut Street,
PHILADELPHIA.



Carrington & Co.'s
GENERAL
PURCHASING
AGENCY,
In Connection with all the Expresses
No. 30 Broadway,
NEW YORK.

Established 1854.

Purchases to order ANY article wanted from New York, (or from Europe,) for ladies' or gentlemen's use or wear,—comfort or luxury—from a cameo to a cashmere—a sea ring to a steam-engine.

Goods purchased at current City prices, and forwarded by Express, or as directed.

Commission, Five Per Cent.

Remittances, with orders, can be made by Express if preferred, as all Express Agents will take orders, receipt for and forward funds, and see to return of Goods.

SPECIAL CIRCULAR.

The Adams Express Company, appreciating the need of a capable medium connecting with the various Express Lines, through which personal and other orders for goods from this city, can be satisfactorily supplied, do recognize CARRINGTON & CO GENERAL PURCHASING AGENCY as such a medium for filling orders for every description of goods wanted from New York, and commend it to the attention of the public, and of our general and local agents, recommending our agents to extend to it all reasonable aid, by facilitating the distribution of its cards and circulars, and making known the advantages it affords.

ADAMS EXPRESS CO.
By W. B. DINSMORE, Prest.
NEW YORK, June, 1864.

We cheerfully concur in the above recommendation of the Adams Express Company.
AMERICAN EXPRESS COMPANY,
By HENRY WELLS, Prest.
UNITED STATES EXPRESS COMPANY,
By D. N. BARNEY, Prest.
WELLS, FARGO & CO.,
NATIONAL EXPRESS COMPANY,
By J. A. ULLEN
HARNDEN EXPRESS,
By L. W. WISCHESTER, Supt.
KINSLEY & CO.'S EXPRESS,
By E. LITTLEFIELD, Supt.
HOPE EXPRESS COMPANY,
A. D. HOPE, Supt.
BREESE & CO.'S EXPRESS,
By STEPHEN BREESE, Supt
NEW JERSEY EXPRESS COMPANY,
By GEORGE R. DUNN, Sup

The Greatest Improvement yet in the Sewing Machine Art!

A CURIOSITY WORTH SEEING!

Please send for circular with sample of sewing.

These Improved Machines save ONE HUNDRED PER CENT. of thread and silk, and make the LOCK-STITCH alike on both sides.

They require no instruction to operate perfectly, except "the printed directions."

No change in sewing from one kind of goods to another.

And no taking apart to clean or oil.

Our NEW MANUFACTORY is now complete, with all its machinery and tools entirely new, and is already rapidly turning out Machines which for BEAUTY and PERFECTION of FINISH are not surpassed by any manufacture in the world.

N. B.—Should any Machine prove unsatisfactory, it can be returned and money refunded.

Agents wanted in counties not vassed by ur own agents.

Finkle & Lyon S. M. Co.
No. 583 BROADWAY, NEW YORK.

GROVESTEEN & CO.,

PIANO-FORTE MANUFACTURERS.

499 BROADWAY, NEW YORK.

The attention of the public and the trade is invited to our New Scale Seven Octave Rosewood Piano-Fortes, which for volume and purity of one are unrivalled by any hitherto offered in this marked. They contain all the modern improvements, French, grand action, harp pedal, iron frame, over-strung bass, etc., and each instrument being made under the personal supervision of Mr. J. H. Grovesteen, who has had a practical experience of over thirty years in their manufacture, is fully warranted in every particular.

THE "GROVESTEEN PIANO-FORTE"

Received the highest award of merit over all others at the Celebrated World's Fair!

where were exhibited instruments from the best makers of London, Paris, Germany, Philadelphia, Baltimore, Boston, and New York; and also at the American Institute for five successive years, the gold and silver medals from both of which can be seen at our warerooms.

By the introduction of improvements we make a still more perfect Piano-Forte, and by manufacturing largely, with a strictly cash system, are enabled to offer these instruments at a price which will preclude all competition.

PRICES.

No. 1, Seven Octave, round corners, Rosewood Plain Case $275.
2, Seven Octave, round corners, Rosewood Heavy Moulding, $300
No. 3, Seven Octave, round corners, Rosewood Louis XIV, style $325, a fac-simile of the accompaning cut.
TERMS—NET CASH, IN CURRENT FUNDS. Descriptive Circular sent free.

LILLIE'S
CELEBRATED
Chilled and Wrought Iron Safes,
WROUGHT IRON FIRE-PROOFS,
LOCKS AND VAULT DOORS.

These Fire-Proofs are manufactured to supply a demand for Security Against Fire, less expensive than my celebrated and superior Chilled and Wrought Iron Burglar and Fire-Proof Safes.

They furnish similar and equal security to the Safes generally manufactured in the different cities, but are SUPERIOR to them in their Fire-Proof qualities and durability, the iron being effectually protected from rust in any climate, and the Fire-proof not subject to lose its utility by age. This is an important advantage gained to the purchaser, as Safes often rust out and become worthless in two or three years.

To substantiate my position, those purchasing these Fire-Proofs are at liberty, by giving me due notice of time and place of trial, to test them by fire with any other Safe of the same size; and should they not prove superior, I will refund the money, or a new Fire-Proof, as the purchaser may decide.

LIST OF SIZES & PRICES OF WROUGHT IRON FIRE-PROOFS

	Outside.			Inside.			
No.	Height.	Width.	Depth.	Height.	Width.	Depth.	Price.
6	40	31	27	31	21	15	$150
5	34	21	26	24	21	14	125
4	31	27	25	22	18	13	110
3	30	24	24	21	15	12	100
2	28	22	23	20	14	12	75
1	24	19	20	17	11	10	50

Sample of Fire-Proof Safe at Office of the Am. Ad. Agency, 389 Broadway, N. Y.

PRICE LIST.
LILLIE'S CELEBRATED CHILLED & WROUGHT IRON SAFES.

BANK, FIRE, AND BURGLAR SAFES.
Folding Doors, D Lock.

	OUTSIDE.			INSIDE.			
No.	Height.	Width.	Depth.	Height.	Width.	Depth.	Price.
	In.	In.	In.	In.	In.	In.	
1	66	50	29	54½	39	18	$950
1½	59	50	26	48	39	15	800
2	53	44	27	42½	33	15	600

MERCANTILE F AND B SAFES.
Folding Doors and Monitor Locks.

3	50	42	27	40	32	16	$500
4	46	42	27	36	32	16	450
4½	38	46	27	28	36	16	450
5	42	38	27	31½	27½	15	350

Single Doors and M. Lock.

6	38	35	26	27½	22½	15	$250
7	34	31	26	24	21	14	200
8	31	28	24	21	18	13	175
9	30	24	24	21	15	12	140
10	26	22	22	19½	18½	12	120
11	24	20	18	17	17	10	100

HOUSE SAFES.

SIDE BOARD	$600
DINING ROOM	350
PANTRY (No. 1)	275
PANTRY (No. 2)	150
DUODECAGON BANK LOCK	100
MONITOR SAFE do.	50
SAFE do.	10

NATIONAL BANK SAFES,
With 2 Inside Burglars and 1 D and 2 M Locks.

	OUTSIDE.		INSIDE.			
No.	Height.		Hei	Width.	Depth.	Price.
	In.		In.	In.	In.	
1	68		55	39	18	$1,200
2	61		48	39	18	1,050
3	57		42½	33	18	900

BANK VAULT BURGLAR SAFES,
With Folding Doors and D Lock.

0	68	53	27	64	48	20	$1,000
0½	61	53	27	55	46	20	800
1	57	47	27	49	40	20	600

BANK VAULT BURGLAR SAFES,
Single Doors and D Lock.

2	58	32	26	49	28	
	42	36	22	38	32	19
4	36	31	20	32	27	
5	30	24	18	26	20	14

BANK VAULT DOORS AND FRAMES,
D and S Lock.

No.	Height clear.	Width clear.	Depth adjustable.	Price.	Weight.
	In.	In.	In.		
1	72	27	20	$400	3,000
2	72	27	20	275	1,500

Orders received and filled at net cash prices, by the AMERICAN ADVERTISING AGENCY, 389 Broadway, New York. All Safes shipped from Troy free of cartage.
Business Department, E. ALVORD.....Corresponding Dept., FOWLER & WELLS.

WEST'S IMPROVED PUMP.
Anti-Freezing, Double-Acting, Forcing, and Lifting

These Pumps have now been in general use a number of years, and give better satisfaction than any other, and are recommended as

THE BEST!

by CAPTAIN ERICSSON and other eminent engineers. We can refer to thousands using them, a guarantee that all will recommend them. They are more simple in construction, and work easie and cost less than all others.

"Our readers will find the double acting, improved pump of J. D. West & Co., one of the best in th ket. It is very simple, works to a charm, so that any child may use it; throws a steady continuous stream, and does not freeze in the coldest exposures, and is unusually cheap. We say this knowingly, and give the testimony of our own accord, without the knowledge or request of the proprietors."—*New York Evening Post, July 1st*, 1863.

"J. D. WEST & Co.: We are pleased to state that the Pumps we had of you about a year ago, have been in constant use, twelve hours each day, and raise for the use of our woolen factory, about 180 gallons per minute. They work with but little power, compared with pumps we have used before, and do not get out of repair, and are satisfactory in all respects.

"DUNLAP MANUFACTURING CO."

Solon Robinson to the Farmers' Club.

Jan. 23.

"No farmer who owns a well or cistern can possibly afford to be without an iron pump. It should be a once a suction and force pump—a perfect little fire engine—such a one known as 'West's Improved Pump.' I speak of this Pump because I happen to know it....to be very simple, durable, powerful and cheap, and it don't freeze up, nor get out of order once a year....I know this, and think I may be doing the farmers good by speaking of it....A boy ten years old can work it, and throw a continuous inch-and-a-quarter stream....It can be made to work in deep wells as well as in shallow ones."

"The undersigned having to use "West's Improved Pumps," cheerfully recommend them as simple, durable, and powerful in raising and throwing water, and for their ease of action, security against frost, and low price, we believe them superior to all others.

"WARREN LELAND, Met. Hotel, N. Y.
"J. W. POMEROY, Yonkers, N. Y.
"JOHN MESSEREAU, N. Y.
"DOMINICK LAWRENCE, Westchester."

From the New York Observer.

"We have had in use for months past one of West's Pumps, which has given us more satisfaction as a force and lifting pump than any we have ever used. It is one of great power, and well adapted for ship's decks, mines, factories, greenhouses, graperies, etc. *The Mining Chronicle and Railway Journal* says: 'It is recommended for its extreme simplicity of construction, great strength, and consequent durability and cheapness of repair. There is no stuffing-box—the pressure being held by a cup packing, like that upon the working-piston, working in a cylinder, fitted for the purpose within the upper air chamber—which we think a great improvement, as stuffing is so liable to be deranged and leak under strong pressure, to say nothing of the loss by friction incident thereto. It has also two air-chambers; thus the action of the valve is cushioned upon both sides by air—preventing water-hammer and vacuum-thump. The valves are very accessible and simply and cheaply repaired. They work much easier than any pump we have ever seen; the 4-inch cylinder being worked by children in wells 100 feet deep, and as they are extremely cheap, as well as simple and strong, we freely recommend them.'"

"CAMBRIDGE MINE, N. C., June 15, 1863.

"J. D. WEST & Co.—Gents: The Pump which I ordered for our mine is received, and put to work in our underlay shaft, which we are sinking. We find that one man will, with ease, lift 50 gallons per minute. We lifted in three and a half hours all the water in the shaft, which measures seven by twelve feet and thirty feet deep, and it was full when we commenced. It answers our expectations in every respect, and our workmen are highly pleased with it. It will do great service with but trifling expense for repairs.

"Yours, respectfully, BURR HIGGINS."

"This may certify, that I have been using, at my manufactory, for the last four years, 'West's Improved Pumps.' I now have in use three of said Pumps, one of which is kept constantly at work, 24 hours of each day (save Sunday, and has been running for the past two years. I pronounce them, unhesitatingly, the best Pumps that have been brought to my notice, having used many others previously. They are simple in their construction, and not easily disarranged.

"N. Y., Oct. 10, 1859. JAS. A. WEBB."

We have plenty more such certificates, but think these are enough. For Pumps, Hose, Pipe, etc., address or call upon

J. D. WEST & CO., 40 Cortlandt st., New York.

Orders may be sent through the AMERICAN ADVERTISING AGENCY, 389 Broadway

EDDY'S

Kerosene Cooking & Heating

STOVES AND RANGES.

THESE COOKING STOVES WILL

☞ *Bake, Boil, Stew, Fry and Roast,*

With the greatest economy and facility, and without heating the room in which they are used. They are perfectly simple, operating like an ordinary Kerosene Lamp with a chimney, and are the only Kerosene Stoves that burn without smoke or odor.

"We have been perfectly astonished to see what a labor-saving, dirt saving and heat-saving institution is EDDY'S PATENT KEROSENE STOVE. Taking the cost of running it, and the result attained, it is the best patent in the market."—*Worcester Daily Spy.*

Our Heating and Cooking Stoves are very convenient and economical, especially where a fire is required but a few hours at a time.

Orders for Stoves may be sent through American Advertising Agency, 389 Broadway, New York.

LESLEY & ELLIOT,
Manufacturers, No. 494 Broadway, New York.
Send for Illustrated Circular. (136

KNITTING MACHINES

FOR

Families and Manufacturers,

☞ *Something New and Invaluable for Family Use.*

We offer the public the simplest, strongest and best Knitting Machine in the world.

It occupies but little space—is portable and can be attached to a stand or table, weighs about 40 lbs.

It will knit a variety of Stitches—the breakage of needles is trifling—the cost of needles is insignificant and the most delicate material can be knit pure and spotless, as the needles are not oiled.

Orders for Machines may be sent through the American Advertising Agency,
389 Broadway, N. Y.

Send for a Circular—Agents wanted.

DALTON KNITTING MACHINE CO.,
137] 537 Broadway, N. Y.

WEED'S

HIGHEST PREMIUM

Shuttle Sewing Machine

Has only to be seen and operated to be Appreciated.

Call and see for yourself before purchasing. Please bring samples of various kinds of thread, (such as is usually found at stores,) and various kinds of fabric, which you know the former most popular Sewing Machines either cannot work at all, or, at best very imperfectly.

SUPERIORITY.

over any other Machine in the market will be seen at a glance.

1st. It runs easily and rapidly, and is so constructed as to endure all kinds of hard usage.

2d. No breaking of threads in going over seams.

3d. No imperfect action of the feed at uneven places in the work.

4th. The Weed-stitch catches of itself, and will sew from the finest lace to the heaviest leather, and 20 cotton to coarse linen thread.

5th. The Weed Machine will do beautiful quilting on the bare wadding, without using inner lining; thus leaving it soft as if done by hand.

6th. The variety of fancy work that can be done on the

WEED MACHINE,

with so little trouble, makes it equal, if not superior, to six machines combined; for instance. it Binds, Hems, Tucks and Sews on the band at the same time, and in face, the

WEED NO. 2 MACHINE,

as before stated, is equivalent to a combination of any six ordinary machines.

Orders for Machines may be sent through the American Advertising Agency. 389 Broadway, N. Y.

Below we give a few prices:

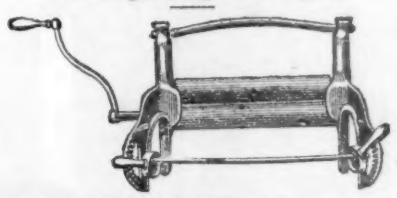
No. 2.	Oil Black Walnut, Ornamented with Hemmer.	$60,00
No. 2.	Oil Black Walnut, Hall Case, Ornamented, with Hemmer.	65,00
No. 3.	Extra Oil Polished Black Walnut, Half Case, Large Table beautifully Ornamented.	75,00

WEED SEWING MACAINE Co.,
36) 506 Broadway, New York

PUTNAM'S CLOTHES WRINGER.

IT IS THE ONLY RELIABLE

Self-Adjusting Wringer.



No Wood-work to Swell or Split. No Thumbscrews to get out of order. Warranted with or without Cog wheels.

It took the First Premium at Fifty-seven State and County Fairs in 1863, and nearly double that number in 1864, and is, without an exception, the *best* Wringer ever made. Patented in the United States, England, Canada, and Australia. Agents wanted in every town, and in all parts of the world. Energetic agents can make from $3 to $10 per day.

WHAT EVERYBODY KNOWS, VIZ.:

That Iron well galvanized *will not rust.*
That a *simple* machine is better than a complicated one.
That a Wringer should be *self-adjusting, durable, and efficient.*
That thumb-screws and fastenings cause *delay* and *trouble* to regulate and keep in order.
That wood soaked in water will *swell, shrink,* and *split.*
That wood-bearings for the shaft to run in *will wear out.*
That the Putnam Wringer, with or without cog wheels, will *not tear the clothes.*
That cog-wheel regulators are not essential.
That the Putnam Wringer has *all* the advantages, and *not one* of the disadvantages above named.
That all who have tried it pronounce it the *best* Wringer ever made.
That it will wring a thread or a bed-quilt *without alteration.*

We might fill the paper with testimonials, but insert only a few to convince the skeptical, if such there be; and we say to all, *test* Putnam's Wringer. Test it *thoroughly* with *any* and any others, and if not entirely satisfactory, return it;

PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydize or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,

JOHN W. WHEELER, Cleveland, O.

Many years' experience in the galvanizing business enables me to indorse the above statement in *all particulars.*

JOHN C. LEFFERTS, No. 100 Beekman St.

NEW YORK, *January*, 1864.—We have tested Putnam's Clothes Wringer by practical working, and know that it will do. It is cheap; it is simple; it requires no room, whether at work or at rest; a child can operate it; it does its duty thoroughly; it saves time, and it saves wear and tear. We earnestly advise all who have *much* washing to do, with all intelligent persons who have *any*, to buy this Wringer. It will pay for itself in a year at most. HORACE GREELEY.

PRICES—$8, $9, and $10.
Sample Wringers sent, express paid, on receipt of price.
Manufactured and sold, wholesale and retail, by

PUTNAM MANUF'G CO.,
13 PLATT STREET, New York,
BENNINGTON, Vt.,
CLEVELAND O.

WATER AND GAS PIPE.

The Boston Bituminized Pipe Company,

Are now manufacturing and prepared to take orders, for their PATENT PIPE, (from 2 to 12 inches in diameter,) as a substitute for Iron, Copper, Lead, &c., for the conveyance of WATER, GAS, SEWERAGE, &c. &c.

From the testimonials received, and the entire satisfaction it has given those having it in use, we feel warranted in claiming for this pipe over that of any other, the following advantages, viz.:

It is much CHEAPER—has great strength (it having been tested to 500 lbs. to the square inch,) combined with LIGHTNESS, costing less for transportation; the joints are easily made and perfectly tight; it does not expand or contract from different degrees of temperature, and is free from *CORROSION* or *CONCRETIONS* forming; does not impart any taste or injurious properties to water, and as far as anything can be said to be indestructible, we deem this to be.

As a GAS PIPE, we say it has no superior. The Lowell Gas Light Co., purchased and laid some of this Pipe last year, and have likewise subjected samples to a test of four months duration in their dry lime purifiers, with the most satisfactory results, in fact establishing beyond a doubt, its perfect adaptation to the wants and requirements of Gas Companies. specimens of which, together with the statement of E. Cushing, Esq., Agent Lowell Gas Light Co., who made these experiments. I shall be pleased to show, and give all other needed information, by applying in person, or by letter, to JOHN L. WEBSTER, Treas.,

Boston Bituminized Pipe Co.,
127] No. 2 Pearl st. House, Boston.

AMBROSE SPENCER GILCHRIST.
(LATE CAPT. U. S. V.,)
CIVIL, MINING
AND ARCHITECTURAL ENGINEER,
No. 200 BROADWAY, Office 12.
New York.

New York, April 18th, 1864.

* * * * * *

We respectfully invite your attention to and consideration of the justly celebrated and reliable remedy for DYSPEPSIA, HEARTBURN, DEBILITY and PROSTRATION. The Proprietors are proud to acknowledge the unparalleled success which has attended the sale of their valuable preparation, known in nearly every portion of the civilized world as the

"GOLDEN BITTERS."

We risk nothing when we term them a *valuable preparation*, for they are one of the few articles of the present day which are not a humbug; and we are willing and able to satisfy any person or persons who will call upon us, that the celebrated "GOLDEN BITTERS" are a genuine *bona-fide hygienic* article. It is the wish of the proprietors that the virtue of the article be tested before condemning. A decision of their merits by any one who has tried them, is worth a million of purchased bogus testimonials.

For Creating a Healthy Appetite

they are invaluable, and are unequalled as a TONIC. They are mild in their action, and operate by giving *vigor* and *strength* to the system,—not by any change they produce in the solids, but through the medium of the living principle.

They are Purely Vegetable,

being composed of Gentian Root, Calamus, Sassafras, and many other remedial agents of the Vegetable world, all preserved in Jamaica Rum and Sherry Wine.

As a Beverage,

They are the most *wholesome, invigorating* and *palatable* stimulant ever offered to the public. And the fact of their being prepared chemically and scientifically, precludes the possibility of a bitter, unpleasant taste, common to Bitters generally offered for sale. We especially recommend them to LADIES, and particularly to those suffering from

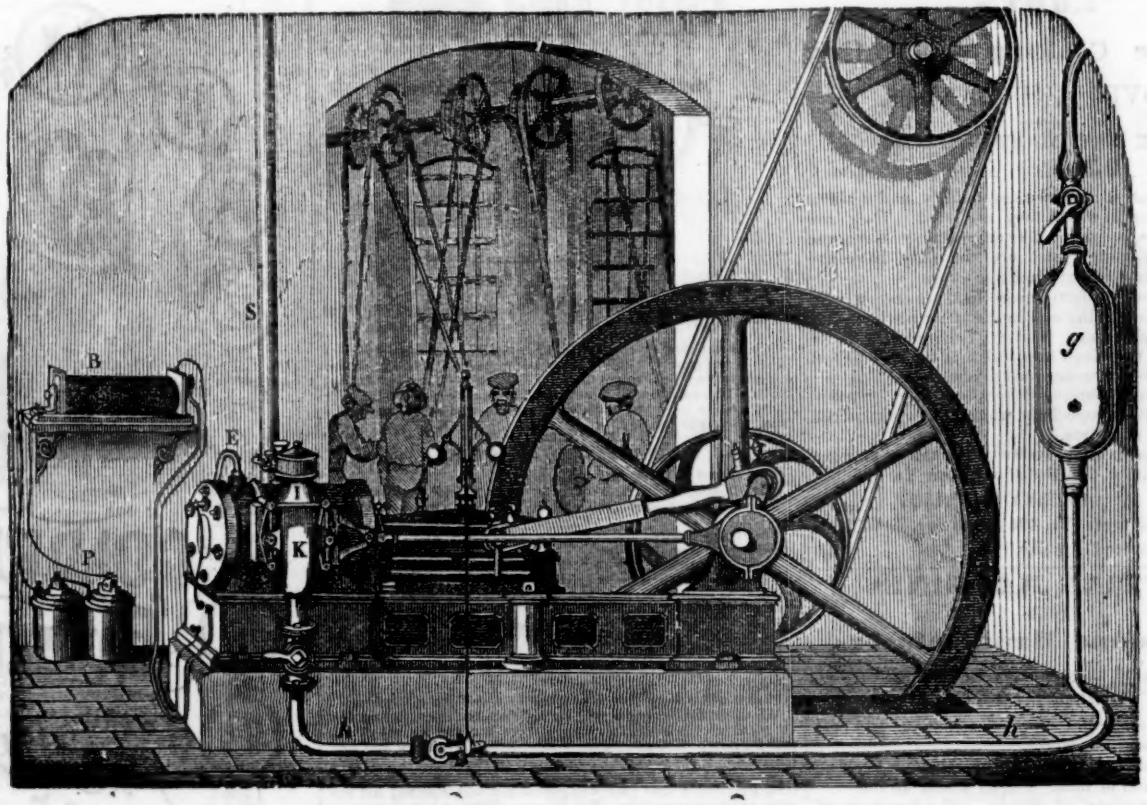
DEBILITY, WEAKNESS, AND PROSTRATION.

Half a wine glass of these "Bitters" three or four times a day, will produce a remarkable healthy change in persons greatly debilitated.

The "Golden Bitters" have been tried and not found wanting. They are put up in our own *Patent* quart bottles, and for sale by Druggists, Grocers, &c., throughout the world. Each bottle bears a fac-simile of the signature of Hubbel & Co.

GEO. C. HUBBEL & Co., Sole Proprietors
CENTRAL DEPOT, American Exp. Building, New York.

THE GOLDEN BITTERS.—We are not an advocate of stimulants or an alcoholic character; indeed we deprecate this "daily tonic" idea—this "morning toddy" which we see offered in all sorts of shapes as a recuperator, invigorator, revitalizer, &c. As a rule all artificial stimulants are dangerous remedies, and must be taken into the system as you would mercury or arsenic, in very small doses. But we have had an opportunity to try the now well-advertised article known as Hubbel's Golden Bitters, and are frank to say that where the system needs building up, where a stimulant is required to aid nature in restoring a lost appetite and infusing a vigorous action to the debilitated functions, we can recommend these Bitters. Hubbel's Golden Bitters are evidently intended to improve the debilitated human system, rather than to tickle the palate, and are, therefore a harmless and safe remedy keep in the house.—*New York Weekly Day Book.*



MOTEUR—LENOIR.

LENOIR GAS ENGINE.

This is a horizontal engine, in which a piston, by a connecting rod drives a horizontal shaft.

The gas enters by the pipe "h" from the regulating reservoir "g," (made of vulcanized india-rubber,) which regulates the feeding and the branches connected with the gas-pipe.

The tube, K, receives the gas conveyed by the pipe "h," and conducts it to the valve, which opens and closes alternately, by means of a rod moved by an eccentric wheel fastened to the end ot the shaft.

Two of Bunsen's piles, P, sufficient to produce the electricity are placed at a little distance from, and in communication with a Ruhmkorff electric apparatus, B. The electric current of this apparatus is conducted by means of insulated wires to the electricity distributor "m," placed on the front of the frame, while the current of electricity and its arrival at the inflammator, inserted at each end of the cylinder, is directed by the movement of the piston-rod, which, by an ingenious combination, impels a small movable slide before the distributor.

The burnt gas, after having performed its functions in the machine, escapes, by means of a valve, through a pipe, S, and the water designed to cool the interior of the cylinder enters through a double passage, by means of a pipe situated near the escape-valve, and goes out by the pipe, E.

A two horse and a half horse Engine are now in practical operation at the Dry Dock Iron Works, No. 435 East Tenth street, near East River, New York, where they are being manufactured, and those interested are invited to call and examine them.

THE LENOIR GAS ENGINE

Requires no Fire and makes no Smoke,

No Noise, no Dirt, and is thoroughly safe.

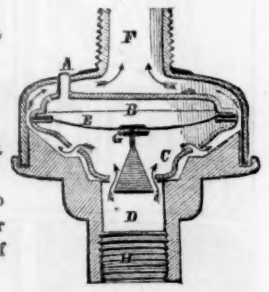
It is propelled by the expansion of Air, dilated by the combustion of Gas within the cylinder, ignited by the

ELECTRIC SPARK

NOTICE TO GAS COMPANIES AND GAS CONSUMER

THOMPSON'S PATENT GAS CONTROLLER,

The only Self-Acting Gas Controller, Regulator, and Burner Combined which has ever been invented, or known to science.



THE PRINCIPLE UPON WHICH THE THOMPSON'S AUTOMATIC GAS CONTROLLER works is one well known to mechanics, and is simple in its operation.

Within the circumference of a small cylinder below the burner is placed a conical valve attached to a movable diaphragm. The diaphragm rises or falls as the pressure of gas from the pipe is lesser or greater, and the valve acts upon the valve-seat with such regularity of movement that in a difference of em five-tenths of an inch pressure to five inches the variation in flame is hardly perceptible.

The simplicity of its machinery and the nature of the material used in its construction insure its regular action and durability.

In consequence of the uniform quantity of gas which passes the Controller to the burner, there is no waste, and a steady, soft flame is produced, which is important to all who read, write, or work by gas-light. The unsteady flickering blaze which invariably exists when the pressure of gas is beyond the requisition for consumption, has injured the sight of thousands who have been subjected to it.

For street lamps these Controllers are especially valuable, because the pressure varies materially during the night, and in consequence there is a waste of gas, and the light variable.

Improvements have lately been made in the mechanism of the Controller which makes them almost a perfect meter to each burner, and they are now offered to he public with more confidence than ever before.

Reference is permitted to the following named gentlemen—

Col. CHAS. ROOME, President Manhattan Gas Company, N. Y.
C. H. SAND , Esq., President Metropolitan Gas Company, "
J. H. ADAM, Esq., President New York Gas Company, "
PETER COOPER, Esq., Cooper Institute, "
JOHN A. DUFF, Esq., Olympic Theatre, "
GEO. H. KITCHEN, Inspector of Gas Meters, N. Y
A. L. BOGART, Esq., Gas Engineer.
Col. J. A. SABATTON, Engineer Manhattan Gas Company.
Col. A. J. WHITE, Engineer Metropolitan Gas Company.
J. K. SIMPSON, Esq., Engineer Cooper Institute.

Persons interested are invited to call at the Office, 111 Pearl street, where they can see the operation by pressure guage and test meters]

M. L CALLENDER, Agent
Office, 111 PEARL STREET.

THE AMERICAN METER CO.

Organized under the General Manufacturing Laws of the State of New York

SAMUEL DOWN, PRESIDENT. HENRY CARTWRIGHT, VICE PRESIDENT. RICHARD MERRIFIELD, SECRETARY AND TREASURER

TRUSTEES.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS & REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

West Twenty Second Street, New York. Arch and Twenty Second Streets, Philadelphia. No. 23 West Street, Boston will meet with prompt attention.

Harris & Brother, Practical Gas Meter Manufacturers,

Continue, as heretofore at their old Establishmen, No. 1117 CHERRY ST., PHILADELPHIA, to Manufacture

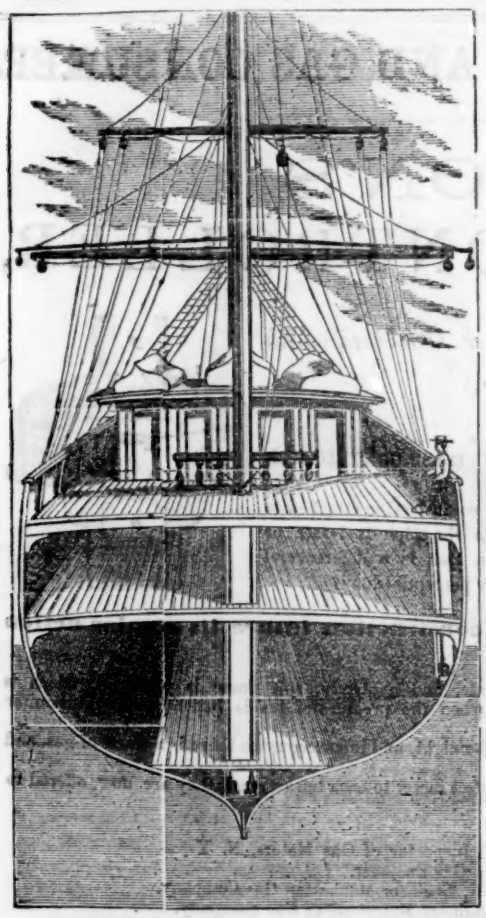
WET AND DRY GAS METERS, and all kinds of GAS APPARATUS, and furnish all articles appertaining to the use of Gas Works. ☞OUR WORK WARRANTED—Satisfaction Guaranteed. Orders respectfully solicted, and promptly attended to, by
HARRIS & BRO., No 1117 Cherry st., Philadelphia.

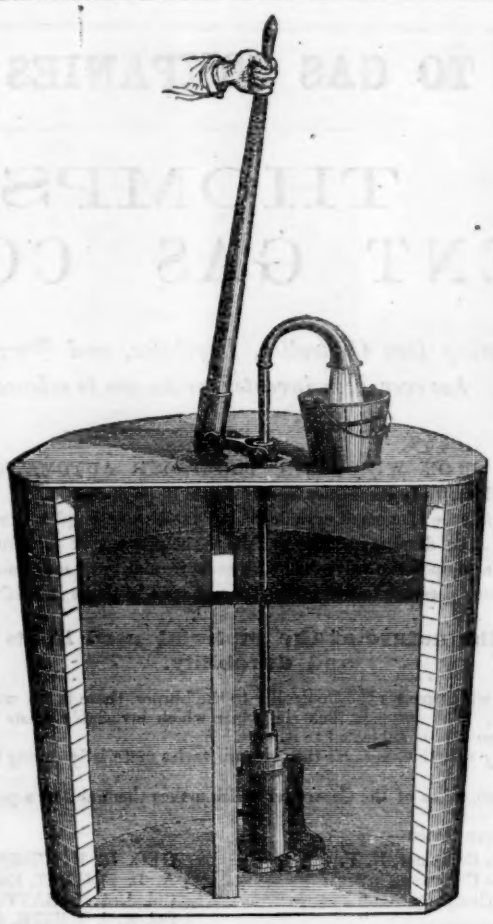
Messrs Harris & Brother,
Philadelphia Gas Works, February 14, 1857.
Dear Sirs;—I take great pleasure in stating that we have found your meters to register with entire correctness, and to be generally of very good quality—the number furnished by you to these works is over 5,000.
JOHN C. CRESSON, Enigneer;

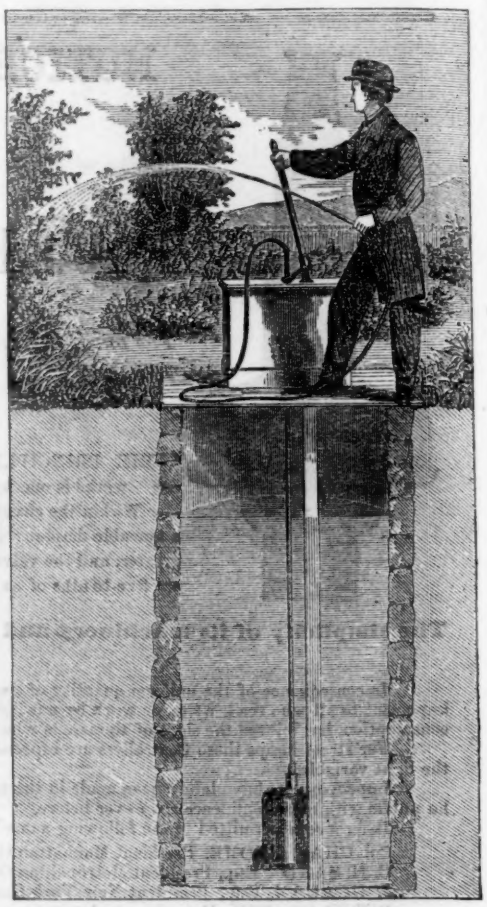
Office of the Gas Light Company of Augusta, Ga., March 6th, 1858.
This is to certify that having used meters manufactured by Messrs. Harris & Bro., for the last nine years, we do not hesitate to state they have given entir8 satisfaction in point of wokmanship and accuracy of registration; they are surpassed by none, and equaled by few manufactories in the Union; we have used meters made by other establishments but our preference is in favor of those made by Harris & Bro., of Philadelphia, Pa.
G. S. HOOKEY, Superintendent of the Gas Light Company of Augusta, Georgia.

Messrs. Harris & Brother, Philadelphia.
Philadelphia, March 4, 1858.
Gentlemen—We take great pleasure in bearing our testimony to the very superior character of the meters we have received from your establishment. We have always found the workmanshipall we could desire, while the accuracy and reliability of their measurement have always been satisfactory. We have used meters made by other parties, and none have given as entire satisfaction as those received from you. We are, gentlemen, very truly, yours, BIRKINBINE & MEARS.

Messrs. Harris & Brother.
March 14, 1857.
Gentlemen—For the last ten years we have used in the Philadelphia Gas Works, meters made in your factory, and take pleasure in expressing my opinion to their correctness. On several occasions I have taken your meters apart, and found the material used in the manufacture of the same, to be as fine quality as is used in those mported from Europe, or made by any of the manufacturers in the United States. Respectfully Yours, GEORGE WIEGAND, Inspector of Gas Fittings, Philadelhia.







AMERICAN PUMP MANUFACTURING COMPANY,

DEPOT NO. 40 DEY STREET, NEW YORK.

A. B. VAN OLINDA, Secretary. C. V. B. OSTRANDER, Treasurer. E. BEADLESTON, President.

STATE AND COUNTY RIGHTS FOR SALE.

Pumps, completed, will be delivered from the manufactory of the Company, to parties purchasing rights at a royalty of One Dollar each.

THE PATENT SUBMERGED PUMP.

This valuable Invention, now first introduced, will, it is believed, supersede all classes for any purpose in use at the present time.

ITS ADVANTAGES.

FIRST.—SIMPLICITY. The entire pump is composed of but six parts, all of cast-iron, which can be put together by any mechanic.

SECOND.—DURABILITY. From the fact that it is always submerged, it is perfectly lubricated, and requires no packing. As no water can remain in the pipe when not in motion, there is no danger of freezing.

THIRD.—CAPACITY. It is contended that, for the power applied, this Pump excels all others. The No. 1 (the smallest size,) of this Pump, with the power of one hand, has a capacity of thirty gallons per minute, and will throw a stream seventy feet in the air.

FOURTH.—CHEAPNESS. For economy, this Pump surpasses all others, its first cost being about one-third less than that of other Pumps of the same capacity, and being much less both in size and weight, there is a great saving in transportation.

ITS USES.

FIRST.—For a House Pump; the smallest size of the patent Submerged Pump is sufficient for all family purposes. Placed in a well or cistern, water may be conveyed to every room in a common sized house.

SECOND.—For a Farm Pump; for all purposes connected with irrigating, watering stock, etc., etc. This Pump can be placed in running streams, ponds, bayous, etc., and water conveyed to any required distance.

THIRD.—For a Ship Pump; Any ship owner or captain, with short experience in the use of this Pump, will give his unqualified approval for ship purposes, either to be used as a bilge pump simply, or for washing decks, etc. From its simplicity, as a bilge Pump it will be found entirely free from choking, and will clear grain, dirt, stones, etc., with ease.

FOURTH.—For a Factory Pump, or for air in Oil Wells, for Breweries, or for pumping acids, hot liquors, etc., it is invaluable. It cannot be affected by any liquid.

FIFTH.—To all Directors and Officers connected with mining interests, the PATENT SUBMERGED PUMP presents great advantages.

The experience of the last five years have clearly proved at what great expense, both in first cost and freight, it has been necessary to be at to secure the proper means of expelling water from the mines, quarries, etc. With this Pump an immense saving is effected in both instances, as in first cost it is much less than other Pumps of the same capacity and power.

Its principle is that of a Double-acting Force Pump, with a heavy double-acting piston cast in one piece, and a double-acting iron valve within the same, without the use of leather valves or any packing whatever.

DIRECTIONS FOR ADJUSTING PUMPS.

1st. Find the exact measurement of the well or cistern from the extreme bottom to the top or curb, after which make such an allowance as may be required, above the curb or top, as will accommodate the sized vessel required to be used, and in respect to the quantity of pipe required, always deducting for the length of the Pump and the space between the bottom and the Pump. 2d. Provide a plank, to which the Pump must be secured, not less than seven inches wide by two or two and a half inches thick, which should reach from the bottom to the top of the well or cistern, always placing the plank on the side of the well or cistern. 3d. Before putting the plank into a well or cistern, fit and bolt the Pump to the plank, and screw the pipe firmly in, taking care to have the Pump not less than one foot from the bottom of a well, nor less than six inches from the bottom of a cistern. Yet, if the water be six feet deep in a well, then adjust the Pump three feet from the bottom, and in like proportion as the case will permit, always being governed by the depth of water in the well, and always observing the necessity of securing the plank at the bottom of the curb, by braces across the well, and standing perfectly plumb and solid under the platform orcovering of the well, when the fulcrum can be fastened to the platform, taking care to give the pipe free action when in motion.

APR. 20, 1866.